

*Medical*

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### SUPPLEMENT NUMBER 12 ON WAR MEDICINE AND SURGERY.

Fractures of the Shaft of the Femur in the Adult.

#### THE PHYSIOLOGY OF CHRONIC NEPHRITIS.<sup>1</sup>

By J. M. HAYMAN, JUNIOR,  
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United States Army.

BEFORE discussing the physiology of chronic nephritis, it is necessary to recall a few anatomical facts. Each human kidney is made up of approximately a million and a quarter units or nephrons, each consisting of a glomerulus and its attached tubule. This number is present at birth and in health persists throughout life. There is no regeneration or new formation of glomeruli. Once a glomerulus is destroyed by disease, the total glomerular equipment of the subject is reduced. The condition is quite different, however, with the epithelium of the convoluted tubules. Here regeneration takes place readily and rapidly, presumably from those cells which have escaped destruction.

The mechanism of urine formation in the normal kidney is generally considered, at the present time, to consist of two main processes, glomerular filtration and tubular reabsorption. That is, in the glomerulus a protein-free filtrate is formed by the physical process of filtration, the filtering force being the glomerular capillary pressure. If the glomerular membrane is damaged, it becomes more permeable and protein molecules pass through it, causing albuminuria. This filtrate contains all the substances present in plasma and in the same concentration. As this glomerular filtrate passes down the tubule, most of the water, glucose, sodium and other substances found in the urine in lower concentrations than in the blood are reabsorbed by the "vital" activity of the tubule cells, while some of the urea, uric acid and other waste products with small molecules, concentrated in the lumen of the tubule by the reabsorption of water, are diffused back through the

epithelial cells into the blood stream. In addition to these processes, a few substances, such as phenol-sulphonaphthalein, "Diodrast" and probably creatinine and some organic acids, are secreted into the tubular lumen by the epithelial cells. The usual volume of glomerular filtrate is about 120 cubic centimetres per minute, and that of urine about one cubic centimetre.

In certain types of chronic nephritis (chronic glomerular nephritis and vascular disease or arteriolar nephrosclerosis) the kidneys are reduced in size, and examination of microscopic sections shows many destroyed glomeruli and hyaline scars. Neither the size of the kidney nor the number of visible scars bears any satisfactory relation to the duration of disease or the degree of impairment of kidney function. While many of the remaining glomeruli are seen to be more or less damaged, the tubular epithelium is frequently not strikingly abnormal. If the remaining nephrons functioned in the normal manner, such kidneys might be expected to excrete a small amount of normally concentrated urine. In fact, however, the urine volume is increased, and concentrating power is diminished or lost. Must it be assumed, therefore, that, in addition to the apparent loss of a number of nephrons, those which remain are qualitatively abnormal?

One of the first questions to be answered in the study of the subject was whether the reduction in the size of the kidney in chronic Bright's disease was a measure of the reduction in the number of nephrons. This involved counting the number of glomeruli. Fortunately, Kunkel<sup>2</sup> had developed a method which with slight modification was suitable. Blood was washed from kidneys obtained at autopsy through a cannula tied in the renal artery, and the kidney was then perfused with a mixture of potassium ferrocyanide and ferric ammonium citrate. It was then weighed, cut into pieces, and put in 50% hydrochloric acid solution for twenty-four hours and then transferred to water. The acid precipitated the iron salts as Prussian blue and macerated the kidney. Since the glomeruli were more resistant to acid than the parenchyma, it was possible, by adjusting the time in acid and water, to obtain a suspension which, under the low power of the microscope,

<sup>1</sup> Read at a meeting of the Saint Vincent's Hospital Clinical Society on June 10, 1942, at Melbourne. Colonel Hayman has explained that he presented this paper as a private individual, and not in his capacity as a military officer.



showed the glomeruli as well-preserved blue balls. These could then be counted in aliquots of the suspension. By cutting a number of blocks for histological sections from various parts of the kidney before digestion, it was possible to correct the count of injected glomeruli for apparently patent but uninjected glomeruli, and from the ratio of injected glomeruli and hyaline scars, to estimate the total number of glomerular structures.

In 14 normal kidneys from patients aged one hour to eighty-eight years, the total number of glomerular structures varied from 940,000 to 1,542,000.<sup>(2)</sup> The mean was  $1,282.8 \pm 37.7$  thousand. Some few hyaline scars of destroyed glomeruli were identified in 10 of the 14 kidneys, particularly in the older subjects. In chronic glomerular nephritis and in vascular disease, however, the number of possibly patent glomeruli is usually reduced to below 500,000 and may be below 200,000, while the total number of recognizable glomerular structures, including scars, is likewise reduced. The reduction of the number of glomeruli was not paralleled by a corresponding reduction from the expected normal weight of the kidney. Nor could the reduction in the number of glomeruli be judged by the relative number of hyaline scars, for in some kidneys with a low total number of recognizable glomerular structures, the percentage of scars was relatively low.

The reduction in the total number of recognizable glomerular structures indicates that in chronic kidney disease many of these may disappear without leaving recognizable trace. The same result was obtained in rabbits whose kidneys had been injured by X rays or by kinking of the ureter for a few days.

If a large proportion of the glomeruli in chronic renal disease can disappear without leaving a trace, the final histological examination may give less information concerning the pathogenesis and severity of the disease than is commonly thought. It is not fair to assume that the changes affecting the remaining glomeruli are necessarily the same as those that occurred in the glomeruli that have disappeared.

Since it had been found that there was no correlation between kidney function during life and kidney weight after death, the next question was whether a relation did exist between kidney function and the number of remaining patent nephrons. Two commonly used tests of renal function, the urea clearance test of Möller, McIntosh and Van Slyke,<sup>(3)</sup> and the maximum specific gravity or concentration test, were carefully carried out on a number of patients suffering from renal disease but without evidence of heart failure, and then the number of glomeruli was estimated at autopsy from a few days to several months later by the method just described.

If the mean urea clearance, in percentage of normal, is plotted against the number of glomeruli per kidney, a reduction in clearance with a decreasing number of nephrons is apparent.<sup>(4)</sup> The relation, however, is not a direct one, function being reduced more rapidly than the number of nephrons. In spite of considerable scattering, the points fall fairly well along an exponential curve concave upward. In contrast to this, when the renal mass had been reduced by subtotal nephrectomy in dogs, the percentage reduction in clearance was less than the reduction in glomeruli, so that the curve was convex upward. In the dogs the remaining glomeruli were normal, while in the patients many at least of the remaining nephrons were more or less damaged. The pathological changes may include not only a reduction in the area of filtering surface, but also a decrease in the permeability of the glomerular membrane, so that there is less filtrate for a given filtering area and capillary pressure.

The concentration test is a sensitive, reliable and easily performed test of renal function; but it is well known that the specific gravity of the urine may reach a minimum value of about 1.010 while the patient is still free from symptoms, and that with further progress of the disease no further reduction in specific gravity occurs. Alving and Van Slyke<sup>(5)</sup> compared the urea clearance and concentration tests and found that both were equally good until the specific gravity of the urine had fallen to 1.010, which occurred when the value for the urea clearance had

reached about 35% of average normal. After this the clearance test alone showed the progress of the disease. These facts are confirmed by a correlation of the maximum specific gravity and the number of glomeruli. The shape of the curve is different from that afforded by a correlation of the urea clearance value and the number of glomeruli. It is approximately a horizontal line up to between 700,000 and 800,000 glomeruli per kidney, and then it rises at an angle of about 45° to the normal range. The point of apparent discontinuity, about 700,000 or 800,000 glomeruli per kidney, corresponds to about 35% of normal urea clearance. The reason for this apparent discontinuity invites speculation. It may correspond to the point at which all the remaining glomeruli become continuously active.

There is little correlation between the systolic blood pressure and the estimated number of glomeruli, except that no patient was encountered with less than 700,000 glomeruli per kidney who had a systolic pressure below 150 millimetres of mercury. On the other hand, a person with a normal number of injectable glomeruli may have an elevated blood pressure. The data on hand, however, at least suggest that when the glomeruli have been reduced to 700,000 or 800,000 per kidney, there is some change associated with the presence of elevated blood pressure and loss of concentrating power. It does not follow, however, that these are causally related, for dogs in which Goldblatt and his co-workers had produced marked persistent hypertension by constriction of the renal arteries retained a normal urea concentrating power, and some dogs in which hyposthenuria had been produced by subtotal nephrectomy showed no significant rise in blood pressure.

While it might be possible to explain the increased volume of dilute urine passed in chronic Bright's disease on the basis of flood diuresis resulting from the elevated capillary pressure and possibly increased blood flow through the remaining nephrons, the facts could be accounted for equally well if the remaining tubular epithelium had lost its concentrating power. The evidence on this point is indirect. If about half of one kidney is removed from a dog, and some weeks later the other kidney is excised, the animal puts out an increased volume of dilute urine, and the specific gravity is not raised significantly by the withholding of water for twenty-four or even forty-eight hours.<sup>(6)</sup> Kidney function is reduced, blood urea level is elevated, and in some animals blood pressure is moderately elevated. With a reduced number of nephrons, lowered urea clearance and apparent loss of concentrating power, the renal function of these animals simulates that of chronic nephritis. Injections of pituitrin and adrenal cortical extract, and the administration of a diet rich in protein had no effect on the specific gravity of the urine. When, however, the concentration of plasma protein was raised by severe dehydration or by the injection of concentrated plasma, the animals excreted a small volume of urine with a specific gravity as high as during the control period before operation. The increase in concentration of plasma protein presumably diminishes effectual pressure in the glomerular capillaries, resulting in a smaller volume of glomerular filtrate and consequent better opportunity for reabsorption of water by the tubular epithelium. Urine of high specific gravity was also obtained when blood pressure was lowered to just above the critical level (about 70 millimetres of mercury) by spinal anaesthesia. Here again, the mechanism is probably dependent on a smaller volume of filtrate. Since it is hard to believe that either of these procedures would suddenly restore abnormal tubular epithelium to normal, it seems fair to assume that the hyposthenuria was due to changes in blood pressure or flow, or to changes in the composition of the blood, rather than to abnormality of the tubule cells. A few observations of the effect of lowered blood pressure on patients suffering from chronic nephritis are consistent with this. Both Christian and Mosenthal have commented that a patient who has had hyposthenuria for a long period may excrete urine of high specific gravity before death. I have confirmed this finding, and found that it occurs when systolic blood pressure falls to 70 to 90 millimetres of mercury and is



maintained at this level for some hours. Patients with systolic blood pressures of 150 to 220 millimetres of mercury who did not excrete urine of higher specific gravity than 1.009 or 1.010 (corrected for any protein present), have, when blood pressure fell to near the critical level, excreted urine having a specific gravity of 1.015 or 1.018. No opportunity has yet been presented to study the effect of increased concentration of plasma protein. Pituitary extract is without effect on the patient suffering from chronic nephritis, as it is on the dog with subtotal nephrectomy.

The composition of the urine—that is, the contribution to the total specific gravity of urea, chloride, sulphate *et cetera*—in chronic nephritis is the same as in the normal subject.<sup>(1)</sup> It is simply more dilute, owing to the greater amount of water excreted. Further, the changes in composition produced by the intravenous injection of urea, sodium chloride or sodium sulphate do not seem to differ significantly from those produced by injection of similar quantities in normal subjects.

#### Summary.

Chronic Bright's disease (chronic glomerulonephritis and arteriolar nephrosclerosis) is characterized by a reduction in the number of kidney units or nephrons. Large numbers of destroyed glomeruli may completely disappear, without leaving recognizable scars.

Kidney function, as measured by the urea clearance test or maximum specific gravity test, correlates better with the number of remaining nephrons than it does with kidney weight.

Dogs rendered hyposthenuric by subtotal nephrectomy will excrete urine of normally high specific gravity when the concentration of the plasma proteins is increased, or when systolic blood pressure is reduced to the level at which urine is just being formed.

While the possibility of qualitative change in the remaining tubular epithelium in chronic nephritis cannot be excluded, it seems probable that the characteristic increased volume of dilute urine may be in the nature of a flood diuresis through a small number of nephrons, mediated through changes in the composition of the blood, in the calibre of vessels or in blood flow.

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### THE HIPPURIC ACID EXCRETION TEST IN PREGNANCY.

By LYSBETH SLOMAN, B.Sc.,

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In 1933 Armand Quick<sup>(1)</sup> published his investigations on the elimination of hippuric acid after the oral administration of sodium benzoate, and described the

procedure by which he had overcome the difficulties experienced by other investigators in controlling various factors in the estimation of hippuric acid. He tested the elimination of hippuric acid in various diseases of the liver, and considered that an impairment in the excretion of hippuric acid was present in liver disease and that the estimation of hippuric acid excreted could be used as a reliable test of liver damage. For convenience he expressed the excretion of hippuric acid in terms of benzoic acid; he considered that an excretion of 3.0 grammes of sodium benzoate was normal and that the range of normality was 2.4 to 3.3 grammes.

Various workers have used the test in diseases of the liver and gall-bladder, in thyroid disease, in surgical states and in schizophrenia.

There have been very few investigations on the excretion of hippuric acid in normal pregnancy and in the complications of pregnancy. Quick<sup>(2)</sup> describes one case of toxæmia of pregnancy in which, after the ingestion of 5.9 grammes of sodium benzoate, the patient excreted 2.12 grammes of benzoic acid in four hours, or 71% of his normal figure of 3.0 grammes for normal subjects. He makes the following remark<sup>(3)</sup> when commenting on Hirschelmer's<sup>(4)</sup> work:

In pregnancy the hippuric acid test seems to give rather weird results—low hippuric acid excretion before delivery and a normal function soon after the baby is born.

Kohlstaedt and Helmer, quoted by Boyce and McFettridge,<sup>(5)</sup> used the test in five cases of toxæmia of pregnancy and found the values generally low.

Hirschelmer and Miller, in 1939, used the hippuric acid excretion test on 74 normal pregnant women and on 15 suffering from toxæmia of pregnancy, and they repeated the test in 26 of the cases during the puerperium. They gave 5.9 grammes of sodium benzoate by mouth and collected the patients' urine for four hours. They found that the average amount excreted in normal pregnancy was 2.57 grammes of benzoic acid, and the average amount excreted by patients with toxæmia of pregnancy was somewhat lower—2.4 grammes of benzoic acid. In all cases but one, in which the test was repeated during the puerperium, there was an increase in the amount excreted.

The conclusions of Hirschelmer and Miller were as follows:

1. Excretion of hippuric acid after sodium benzoate was given by mouth, was subnormal in more than half of a group of women with uncomplicated pregnancy; a smaller group of patients who developed toxæmia showed a somewhat higher incidence of the same depressed function.
2. Post partum the same test showed increased yield of hippuric acid in almost all cases, and similarly, a return to normal by those giving low ante partum values.
3. Renal function must be checked when low values are obtained.

#### THE PRESENT INVESTIGATION.

The tests were performed to establish figures for normal pregnancy and for complications of pregnancy without known liver disease, and to ascertain how soon after parturition the hippuric acid excretion returned to normal.

The present investigation was carried out at the Women's Hospital, Crown Street, Sydney. The test was performed on pre-maternity in-patients and on a few apparently normal out-patients. The majority of patients conformed to the hospital's standards of normal pregnancy, the criterion for normality being that they were normal at the time of the test and throughout the subsequent course of their pregnancy. A number of patients with toxæmia (hypertension and albuminuria), albuminuria, hypertension, pyelitis and hyperemesis of pregnancy were also tested. The test was repeated on 63 patients during the puerperium, usually on the eighth day.

Quick's original method was used for the first 23 normal patients, but later a modification of the Weichselbaum and Probst<sup>(6)</sup> method (*vide infra*) was adopted. All the patients with complications of pregnancy and all the puerperal patients were tested by the latter method.

### Material Investigated.

One hundred and thirty-four normal pregnant women were tested, three patients being less than three months pregnant and nine being from three to six months pregnant (these were all from the out-patient department of the hospital); the remainder of the patients were from six to nine months pregnant. The tests were repeated on thirty of these patients during the puerperium.

Twenty-two women suffering from toxæmia of pregnancy were tested, and sixteen of these had the test repeated during their puerperium. Twenty-one women suffering from hypertension without albuminuria were tested, and nine of these had the test repeated during their puerperium. Ten women suffering from albuminuria without hypertension were tested, and six of these had the test repeated during their puerperium. Seven patients suffering from pyelitis of pregnancy were tested and three of these had the test repeated during their puerperium. Three patients suffering from hyperemesis of pregnancy were tested, and one of these had the test repeated during her puerperium.

### Methods Used.

Quick's original method was followed, except that one four-hour specimen was collected instead of four hourly specimens.

### Modified Weichselbaum and Probst Method.

The patient is prepared in the following way. (a) She has a light breakfast, but no fruit. (b) One hour later the patient empties her bladder; this specimen is discarded. The draught of four grammes of sodium benzoate in 20 cubic centimetres of water is given, followed by half a cup of water. (c) Two hours later the patient empties her bladder again, and the whole of this specimen is kept. (d) One hour later the patient is given a cup of water to drink. (This was done because patients sometimes had difficulty in voiding the second specimen, and repeated catheterization was thought inadvisable.) (e) One hour later the patient empties her bladder again. The whole of this specimen is kept.

**Method of Estimation.**—The specimens are kept in a refrigerator until the estimation is made; it is carried out as follows. (i) The volume of each specimen is recorded. (ii) One hundred cubic centimetres of the specimen (or the whole of the specimen if it is less than 100 cubic centimetres) is then put into an Erlenmeyer flask, of 150 cubic centimetres capacity, containing 30 grammes of sodium chloride. (The sodium chloride need not be chemically pure.) The flask with its contents is placed in an ice bath for ten minutes. (iii) Two cubic centimetres of 10*N* sulphuric acid are added (Congo-red paper is used as an indicator to make certain that the specimen is acid in reaction); the flask is shaken well and replaced in the ice bath for half an hour. Several times during the half hour the flask is shaken. This shaking is important, as it encourages the hippuric acid to precipitate out. (iv) The precipitated hippuric acid is separated by filtration on a Number 1 Whatman filter paper in a Buchner funnel, and the flask and precipitate are washed with 25 cubic centimetres of ice cold 30% sodium chloride solution. (v) The filter paper and precipitated hippuric acid are then transferred to the original flask; the Buchner funnel is washed through with distilled water, the washings being collected into the flask containing the precipitate, and the precipitate is dissolved by heating of the flask till the contents boil. (vi) The hot solution is then titrated against 0.5 *N* sodium hydroxide solution, a few drops of a saturated alcoholic solution of phenolphthalein being used as an internal indicator.

**Calculation.**—In the calculation of the results, allowance must be made for a certain fairly fixed percentage of hippuric acid that remains dissolved in the urine and is not precipitated. When the hippuric acid excretion is calculated as benzoic acid, 0.00084 gramme per centum remains in solution, so that the volume of the urine multiplied by 0.00084 gives the grammes of benzoic acid not precipitated. The hippuric acid precipitated expressed in terms of benzoic acid is calculated directly from the

titration figure, as follows: when 100 cubic centimetres of urine are taken for analysis, the following equation gives the amount of benzoic acid present:

$$\frac{\text{Volume of specimen}}{100} \times (\text{Number of cubic centimetres of 0.5 N sodium hydroxide solution} \times 0.061) \text{ grammes.}$$

The total amount of benzoic acid present in the specimen is given by the sum of that remaining in solution and the amount is actually found by titration. The total of benzoic acid recovered for the four-hour test period is obtained by adding together the amounts of benzoic acid found in the specimens of urine voided at the end of the second and fourth hours.

### Notes on the Test.

During the course of these investigations, it was shown that the precipitation of hippuric acid was not affected by diuresis, by the presence of colon bacilli in the urine of pyelitis patients, or by the presence of blood in the urine during the puerperium.

Various reactions of patients to the ingestion of sodium benzoate were observed. Headache was present in nearly all cases; several patients who were being treated with sulphanilamide at the time of the test complained of severe headache. Some normal pregnant patients vomited the draught. No patient suffering from hyperemesis vomited the draught. Some patients had difficulty in voiding their urine either at the end of the second hour or at the end of the fourth hour or both.

### Analyses of Results.

In Table I are set out for each group of patients specified the mean, the maximum and the minimum amount of hippuric acid excreted and the standard deviation for each series of observations. In accordance with Quick's method, the hippuric acid excreted is expressed in terms of grammes of benzoic acid.

TABLE I.  
Hippuric Acid Excretion in Pregnancy.

Clinical Classification of Patients.	Number of Patients Tested.	Grammes of Benzoic Acid.			Standard Deviation.
		Maximum.	Minimum.	Mean.	
<b>Normal:</b>					
0 to 3 months pregnant	3	3.09	2.52	2.84	—
3 to 6 months pregnant	9	3.06	1.74	2.42	0.4
6 to 9 months pregnant (Quick's method) ..	23	2.64	0.85	1.68	0.48
6 to 9 months pregnant Weichselbaum and Probst method ..	79	3.08	1.03	2.15	0.47
Puerperium ..	35	3.53	0.88	2.51	0.52
<b>Toxæmia:</b>					
Pregnancy ..	22	2.61	1.24	1.96	0.52
Puerperium ..	16	3.13	0.7	1.9	0.65
<b>Albuminuria:</b>					
Pregnancy ..	10	2.5	1.46	1.93	0.47
Puerperium ..	6	3.2	1.95	2.32	0.45
<b>Hypertension:</b>					
Pregnancy ..	21	3.39	1.11	2.16	0.53
Puerperium ..	9	2.84	1.52	2.36	0.46
<b>Pyelitis:</b>					
Pregnancy ..	7	1.02	0.42	1.36	0.54
Puerperium ..	3	2.33	1.94	2.19	—
<b>Hyperemesis:</b>					
Pregnancy (6 to 9 months)	1	—	—	2.31	—
Pregnancy (0 to 3 months)	2	2.28	1.77	2.02	—
Puerperium ..	1	—	—	3.0	—

The results in each group were then tested by means of Fisher's<sup>(1)</sup> "T-test", to see whether there were significant differences in ability to excrete hippuric acid between the

various groups of patients;  $P = 0.05$  is denoted by "significant" and  $P = 0.01$  by "highly significant";  $P$  greater than 0.05 was regarded as "not significant".

According to Fisher, any differences between means which are shown to be not significant for the number of cases tested might possibly be shown later to be significant by considering a larger number of cases. Any differences which are shown to be significant will always be significant.

The figures for normal pregnancy in Table I indicate a progressive reduction in the excretion of hippuric acid as the pregnancy advances, while after parturition there is a statistically significant increase in the amount excreted, and the normal value for non-pregnant subjects is approached.

The hippuric acid excretion rate for women up to three months pregnant is within the range for normal non-pregnant subjects, averaging 2.84 grammes of benzoic acid.

For normal women three to six months pregnant there is apparently a decrease in the amount of hippuric acid excreted, the average amount being 2.42 grammes of benzoic acid, which is still within the range for normal non-pregnant subjects.

For normal women six to nine months pregnant there is a further decrease in the amount of hippuric acid excreted, the average amount being 2.15 grammes of benzoic acid.

The difference between the mean for the first three months of pregnancy and the mean for three to six months of pregnancy is not statistically significant, nor is the difference between the mean for three to six months of pregnancy and the mean for six to nine months of pregnancy statistically significant. But the difference between the mean for the first three months of pregnancy and the mean for six to nine months of pregnancy is statistically significant. The number of cases in the group up to three months of pregnancy and from three to six months of pregnancy are small, and the fall in the rate of excretion of hippuric acid may prove statistically significant when larger numbers are studied.

#### Complications of Pregnancy.

**Toxæmia of Pregnancy.**—Of 22 patients with toxæmia of pregnancy, the mean rate of excretion of benzoic acid was 1.96 grammes. This figure, although lower than the mean for normal pregnancy, is not significantly different

from the mean for normal pregnancy when tested by Fisher's "T-test".

**Albuminuria of Pregnancy.**—The mean rate of excretion in ten cases of albuminuria of pregnancy not associated with hypertension was 1.93 grammes of benzoic acid. The difference between this mean and the mean for normal pregnancy for the six to nine months' period is not statistically significant.

**Hypertension of Pregnancy.**—The mean rate of excretion of the hippuric acid in 21 cases of hypertension not associated with albuminuria was 2.16 grammes of benzoic acid, slightly higher than the mean figure for normal pregnancy. There is no statistically significant difference between the mean of these cases of hypertension of pregnancy and that of normal pregnancy for the six to nine months' period.

**Hyperemesis of Pregnancy.**—The amount of hippuric acid excreted by patients with hyperemesis of pregnancy in the few cases tested was within the normal range for normal pregnancy. Two of the patients tested were less than three months pregnant, and have an average excretion of 2.02 grammes of benzoic acid. The difference between this figure and that for normal pregnancy for the first three months was not significant. The third patient was 39 weeks pregnant and had an excretion rate of 2.31 grammes of benzoic acid.

**Pyelitis of Pregnancy.**—Seven cases of pyelitis of pregnancy were studied. The mean amount of benzoic acid excreted was 1.36 grammes and the maximum was 1.92 grammes. The difference between the mean in these cases of pyelitis of pregnancy and the mean for normal pregnancy is highly significant. This decrease in excretion of hippuric acid is almost certainly due to kidney dysfunction.

#### Analyses of Results of Tests Performed on Pregnant Women and Repeated during Their Puerperium.

Table II sets out details of tests performed on 30 normal patients, whose hippuric acid excretion was tested both before and after the baby was born. Examination of Table II shows that 18 of these patients reached or exceeded an excretion of 2.51 grammes of benzoic acid on or about the eighth day of the puerperium. The difference between the means of the results obtained during the pregnancy and the puerperium was highly significant.

TABLE II.  
Normal Patients Tested During Their Puerperium.

Case Number.	Number of Pregnancy.	Weeks Pregnant when Test was Carried Out.	Grammes of Benzoic Acid Excreted.	Day of Puerperium when Test was Repeated.	Grammes of Benzoic Acid Excreted.	Difference Between Tests. (Grammes.)
CXIX	6	38	1.64	8th	2.93	1.39
LXXII	1	38	2.47	8th	2.62	0.19
LII	2	38	2.62	9th	2.74	0.12
CXX	8	39	2.51	8th	2.42	-0.09
CXXIII	10	36	1.08	9th	0.88	-1.1
LXXXIII	3	39	2.68	8th	2.12	-0.56
CXXV	4	34	1.43	8th	2.43	1.00
LXIV	2	37	2.33	8th	2.67	0.34
LXXXIX	3	40	2.57	7th	2.48	-0.09
XCIX	1	36	2.16	10th	2.57	0.41
LVIII	1	39	2.27	8th	2.14	-0.13
XLIII	2	40	1.87	7th	2.72	0.85
V	14	32	1.88	8th	2.26	0.98
XCIV	6	34	1.5	8th	2.65	0.85
XCVIII	2	32	1.83	7th	2.66	0.83
LIX	1	42	1.78	8th	2.58	0.8
XCIII	5	40	2.55	8th	2.27	-0.28
XLVI	5	39	1.95	7th	3.25	1.3
CIX	4	41	2.31	7th	2.4	0.09
LXIX	3	38	2.4	7th	3.32	0.92
LXXXIV	4	34	1.71	8th	2.92	1.21
II	2	38	1.57	11th	2.81	1.07
		40	1.74			
VII	3	37	1.97	8th	3.53	1.56
XXXV	2	38	1.73	8th	2.4	0.67
LXXXVII	1	38	2.63	8th	3.18	0.45
CXIII	1	40	1.4	9th	2.62	1.22
CXXI	1	38	2.05	9th	2.74	0.69
LXVIII	12	40	2.08	8th	2.74	0.66
XCH	1	40	2.84	8th	1.92	-0.82
III	2	38	1.03			
		39	1.64	8th	2.24	0.6



This mean for the puerperium of normal women is within the range as laid down by Quick for normal non-pregnant subjects.

**Toxæmia of Pregnancy.**—The details are given in Table III. The mean excretion rate of hippuric acid in the puerperium was 1.9 grammes, while the mean during the pregnancy was 1.96 grammes. The difference between these two means is not statistically significant. Of the 17 cases, in nine there was a lower excretion rate of hippuric acid in the puerperium than during the pregnancy, and in only two of the 17 cases was the mean figure for non-pregnant normals attained at the time when the tests were carried out. The difference between the mean excretion rate in tests performed during the puerperium on patients who had had toxæmia of pregnancy and the mean excretion rate of tests carried out during the puerperium on normal patients is highly significant. The majority of the toxæmic patients examined were *primiparæ*. These results indicate that after parturition in cases of toxæmia of pregnancy, the liver takes a relatively long time to recover its ability to conjugate benzoic acid. Unfortunately it was not possible to repeat further the tests on any of these patients after their discharge from hospital.

**Albuminuria of Pregnancy.**—The details are given in Table IV. The mean excretion rate of hippuric acid during the pregnancy of these patients is 1.93 grammes of benzoic acid; the mean excretion rate during the puerperium is 2.23 grammes. These results indicate that in the majority of cases of simple albuminuria of pregnancy, the hippuric acid excretion rate, though low during the pregnancy, increases during the puerperium and approaches the normal for non-pregnant subjects. This rise in the puerperium is of no statistical significance. There is no statistically significant difference between the mean for the tests performed during the puerperium on patients who had had albuminuria of pregnancy and the mean for the tests carried out during the puerperium on normal patients.

**Hypertension of Pregnancy.**—The details are given in Table V. The mean excretion rate of hippuric acid during the pregnancy of these patients is 2.16 grammes of benzoic acid; the mean during the puerperium is 2.36 grammes, and although this is lower than the mean excretion rate for the puerperium of normal patients, it is not significantly different from it.

**Hyperemesis of Pregnancy.**—One patient who had suffered from hyperemesis had the test repeated during

TABLE III.  
*Patients Suffering from Toxæmia of Pregnancy; Tests Repeated in the Puerperium.<sup>1</sup>*

Case Number.	Number of Pregnancy.	Weeks Pregnant when Test was Carried Out.	Grammes of Benzoic Acid Excreted.	Day of Puerperium when Test was Repeated.	Grammes of Benzoic Acid Excreted.	Difference Between Results.	Remarks.
XI	1	40	2.58	10th	2.47	-0.11	
XXXI	2	38	1.7	8th	2.2	+0.5	
LXXXVIII	1	40	2.61	7th	2.19	-0.42	
CXI	1	40	1.24	8th	2.12	+0.88	
LVII	2	39	2.19	11th	1.88	-0.31	
XXV	1	39	2.27	10th	1.89	-0.38	
XXXVII	2	36	1.65	9th	2.26	+0.61	Myxœdema.
LV	1	40	1.46	7th	2.44	+0.96	
XXVII	1	36	2.01	19th	2.75	+0.74	Puerperal sepsis.
XXXIII	1	33	1.96	7th	3.13	+1.17	Baby died of prematurity.
LXV	1	35	2.44	8th	0.7	-1.74	Toxæmia in puerperium; baby premature; well.
VI	1	34	1.88	10th	1.71	-0.17	Chronic nephritis; baby died of cerebral hæmorrhage.
XLVIII	7	33	2.23	8th	0.94	-1.29	Baby stillborn, macerated.
				11th	0.94		
XLIV	1	34	2.13	8th	1.76	-0.37	Baby premature; alive.
XII	1	40	1.36	9th	1.00	-0.36	
XXXII	1	38	1.47	8th	2.02	+0.55	

<sup>1</sup> In all cases in which no remarks have been made, the babies were alive and well and the puerperium was normal.

TABLE IV.  
*Patients Suffering from Albuminuria of Pregnancy; Tests Repeated During the Puerperium.*

Case Number.	Number of Pregnancy.	Weeks Pregnant when Test was Carried Out.	Grammes of Benzoic Acid Excreted.	Day of Puerperium when Test was Repeated.	Grammes of Benzoic Acid Excreted.	Difference Between Tests. (Grammes.)
XLII	1	37	1.88		2.14	+0.26
XXXVI	1	36	1.67	8th	3.2	+1.53
XXXVIII	1	35	2.03	7th	2.25	+0.22
XIX	1	36	1.92	8th	2.27	+0.35
XXI	1	36	2.25	8th	1.95	-0.3
CXXVIII	13	32	2.41	8th	2.11	-0.3

TABLE V.  
*Patients Suffering from Hypertension of Pregnancy; Tests Repeated During the Puerperium.*

Case Number.	Number of Pregnancy.	Weeks Pregnant when Test was Carried Out.	Grammes of Benzoic Acid Excreted.	Day of Puerperium when Test was Repeated.	Grammes of Benzoic Acid Excreted.	Difference Between Tests. (Grammes.)
X	2	33	2.26	8th	2.64	+0.38
LX	1	36	1.33	9th	2.84	+1.51
XXX	1	40	1.11	8th	2.83	+1.72
XXIV	1	28	2.3	8th	1.52	-0.78
LXXXV	1	35	1.74	8th	1.94	+0.2
LIV	2	38	2.55	7th	2.17	-0.38
CIV		36	1.62	14th	2.82	+1.2
XX	3	24	2.62	7th	2.39	-0.24
LXIV	1	40	2.15	8th	2.10	-0.05

TABLE VI.  
Patients Suffering from Pyelitis of Pregnancy; Tests Repeated During the Puerperium.

Case Number.	Number of Pregnancy.	Weeks Pregnant when Test was Carried Out.	Grammes of Benzoic Acid Excreted.	Day of Puerperium when Test was Repeated.	Grammes of Benzoic Acid Excreted.	Difference Between Tests. (Grammes.)
XL	1	26	1.92	18th	2.31	0.39
XLII	8	30	0.93	12th	2.33	1.40
XLII	8	31	0.42			1.91
XLII	8	37	1.25			1.08

the puerperium. The hippuric acid excretion rate increased from 2.31 grammes of benzoic acid at the thirty-ninth week of pregnancy to three grammes on the eighth day of the puerperium. The results in this case are of considerable interest, as they indicate that liver damage plays no part in the aetiology of *hyperemesis gravidarum*.

**Pyelitis of Pregnancy.**—Table VI gives details of two cases of pyelitis of pregnancy in which a series of tests were carried out. The patient in Case XLII was anæmic throughout her pregnancy; she gave birth to her third set of twins. The first hippuric acid excretion test was performed when she was thirty weeks pregnant, at which time she was suffering from a moderately severe pyelitis, and 0.93 gramme of benzoic acid was excreted; one week later, when her clinical condition was worse, her hippuric acid excretion rate had fallen to 0.42 gramme; six weeks later, when her clinical condition had improved, her hippuric acid excretion rate had risen to 1.25 grammes. On the twelfth day of the puerperium, when her urine no longer contained colon bacilli, the amount of hippuric acid excreted had risen to 2.33 grammes. From a consideration of this case and the other given in Table VI, it would seem that in cases of pyelitis, after the urine has become sterile in the puerperium, the amount of hippuric acid excreted increases and approaches the normal figure for non-pregnant people. The rise in the excretion rate during the puerperium is statistically significant when compared with the mean of the figures for pyelitis of pregnancy, and the results obtained during the puerperium are not significantly different from the findings during the puerperium of normal women.

#### Summary of Results.

The results may be summarized as follows:

1. One hundred and seventy-seven pregnant women and seventy puerperal women were tested for their ability to excrete hippuric acid after the oral administration of four grammes of sodium benzoate. The patients tested included both normal pregnant women and those with complications of pregnancy.
2. In normal pregnancy the amount of hippuric acid excreted is less than that of normal non-pregnant people.
3. In the majority of cases the amount of hippuric acid excreted reaches Quick's figure for normal after about the eighth day of the puerperium.
4. The hippuric acid excretion rate of normal women up to three months pregnant is within the range for normal non-pregnant people. For normal women three to six months pregnant there is a decrease in the rate of excretion of hippuric acid; but the mean excretion rate is still within the range for normal non-pregnant subjects. For normal women six to nine months pregnant there is a further decrease in the excretion rate, the mean excretion rate being less than the lower level of the normal excretion rate of non-pregnant women. The hippuric acid excretion rate rises in the majority of cases during the puerperium.
5. In cases of toxæmia of pregnancy, the mean excretion rate of hippuric acid was not statistically significantly less than the mean in normal pregnancy. The majority of patients suffering from toxæmia of pregnancy failed to reach Quick's figure for normal excretion by about the tenth day of the puerperium. There is statistically a highly significant difference between the means of the tests carried out during the puerperium on toxæmic patients and the tests carried out during the puerperium on normal patients.

6. In cases of albuminuria of pregnancy not associated with hypertension, the mean hippuric acid excretion rate was lower than in normal pregnancy, but the difference between the means was not statistically significant. Most patients with albuminuria of pregnancy had an increased rate of excretion by the eighth day of the puerperium, and the mean excretion rate was statistically not significantly lower than that of the puerperium of normal patients.

7. In cases of hypertension of pregnancy not associated with albuminuria, the mean excretion rate of hippuric acid was not statistically different from the normal for the latter months of pregnancy. The majority of patients had an increased rate of excretion on or about the eighth day of the puerperium, and although the mean excretion rate had not reached the normal level for non-pregnant people by that time, the difference between this mean and the mean for the puerperium of normal patients was not statistically significant.

8. Seven patients with pyelitis of pregnancy were found to have a diminished rate of excretion of hippuric acid which was statistically highly significant. In two cases tests repeated during the puerperium after the urine had become sterile revealed a pronounced increase in the rate of excretion of hippuric acid, the excretion rate approaching the normal figure for non-pregnant people. The low hippuric acid excretion rate during the pregnancy of these patients was, in my opinion, due to kidney dysfunction.

9. Three patients with *hyperemesis gravidarum* were tested. Two in the nil to three months pregnant period had a low excretion rate, but it was not significantly lower than the mean for normal pregnancy for the nil to three months pregnant period. The third patient at 39 weeks had an excretion rate well within the range for normal pregnant women during that period. The test was repeated in this case during the puerperium and the excretion rate had risen to Quick's normal.

#### General Summary.

1. Figures for the excretion of hippuric acid in normal pregnancy and a normal puerperium are given.
2. Figures for the excretion of hippuric acid in complications of pregnancy and in the puerperium following complications of pregnancy are given.
3. The results are analysed statistically.
4. The rate of excretion of hippuric acid may be low in normal or complicated pregnancy. The cause of the low figures is not apparent. In the present state of knowledge, a poor rate of excretion of hippuric acid has no obvious prognostic or diagnostic significance.

#### ACKNOWLEDGEMENT.

This research was carried out in the pathology department of the Women's Hospital, Crown Street, Sydney, under the guidance of Dr. F. S. Hansman and Dr. R. Mackey, to whom I wish to convey my warmest thanks and appreciation. The statistics were checked by Mr. George Humphrey, M.Sc., of the Department of Biochemistry, University of Sydney.

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### PRECIPITATION IN STORED HUMAN SERUM: A PRELIMINARY NOTE ON THE FACTORS CONCERNED.

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POOLED human serum kept at refrigerator or room temperature may become turbid, or a flocculent precipitate may develop in it. Serum in which such precipitate is present has been administered through a muslin filter on numerous occasions without harmful reactions. But such turbid serum has the disadvantage that its turbidity is indistinguishable from that due to contamination with moulds or bacteria. The purpose of this preliminary communication is to discuss some of the factors leading to the formation of precipitate in stored serum and to recommend methods by which precipitation may be minimized.

#### The Preparation of Serum from Plasma.

The original method of preparing serum in the Sydney centre was that described by Morgan,<sup>(1)</sup> with some modifications. Blood was taken into a "Soluvac" bottle containing 10 mls of a solution of 0.3 gramme of sodium oxalate and 0.372 gramme of potassium oxalate. The average amount of blood collected per bottle was 470 mls. Plasma was obtained from the oxalated blood by centrifugation in a cream separator. The plasma from approximately 60 donors (chosen on the basis of the distribution of blood groups in the community) was pooled in a glass bottle of a capacity of 18 litres. "Merthiolate" was added to give a final concentration of 1:10,000. After storage at 4° C. for periods varying from eighteen to seventy-two hours, the plasma was placed in a water bath at 37° C. for one hour. Calcium chloride (26 millilitres of a 6% solution per litre of plasma) was then added, and the bottle was shaken until the fibrin clot formed was wound round a central rod of stainless steel. The bottle was then placed in the refrigerator for twenty-four hours. The resultant serum was passed through a Seitz filter pad and stored in bulk containers for about six weeks. During this period of storage a precipitate formed, the amount varying in different samples from a slight deposit to a flocculent precipitate often accompanied by turbidity. Prior to the final bottling of the serum it was again passed through a Seitz filter pad, but this did not prevent subsequent precipitation. This method was modified and the alterations are described later in this paper.

#### The Effect of Hydrogen Ion Concentration and Temperature of Storage on Precipitation.

An attempt was made to prevent the formation of precipitates by controlling the hydrogen ion concentration. A pH range from 6.0 to 8.5 was obtained by equilibrating serum with carbon dioxide at varying pressures. The pH measurements were made with a glass electrode, special precautions being taken to prevent any loss of carbon dioxide from the serum during the measurement. The highest carbon dioxide pressures delayed the appearance

of precipitates for about six weeks, but did not prevent it completely. The relationship between the carbon dioxide pressures and the hydrogen ion concentration of serum is shown in Figure 1.

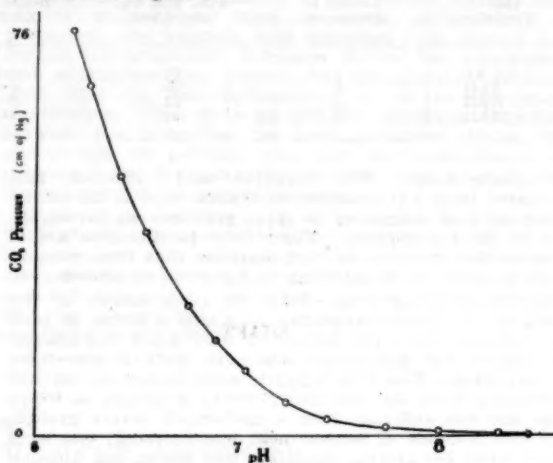


FIGURE 1.

Serum kept at room temperature (18° to 20° C.) showed as little precipitate as that kept at 4° C. or less, irrespective of the pH at which it was maintained. Samples viewed after storage at room temperature had a greenish-brown fluorescence, which was not seen in samples kept in the refrigerator. With increasing acidity the colour of the serum faded rapidly, but fluorescence was still marked.

#### Composition of Precipitate.

Upon analysis, the precipitate was found to contain 6.6% of ether-extractable material, assumed to be fat, and 14.4% to 15.2% of nitrogen, equivalent to a protein content of over 90%. Microscopically, the precipitate appeared to be a gelatinous mass with occasional scattered threads resembling fibrin fibrils.

#### Relation of Fibrinogen to Precipitation.

It was noted that the clotting time of plasma was increased according to the time elapsing between centrifugation and the addition of calcium chloride. When plasma had stood for a long time, it was necessary to add a few mls of plasma recently collected from donors to bring about clotting. Since thromboplastin is the only factor which would be effective in such low concentration, deficiency in thromboplastin must be the decisive factor in the increased clotting time. During storage of plasma changes also take place in fibrinogen. If plasma is stored for long periods, a stage is eventually reached when the addition of calcium chloride and thrombin produces only a tenuous precipitate, quite unlike the normal firm clot. Furthermore, the amount of fibrinogen which can be salted out by sodium chloride and sodium sulphite progressively diminishes during storage of plasma, and this change appeared to be accentuated by the presence of "Merthiolate". It will thus be seen that if there is a delay in the addition of calcium chloride to plasma, there is good reason to believe that clotting will be incomplete, because (a) there is insufficient thromboplastin to initiate the reactions which result in complete clot formation, and (b) some of the fibrinogen may have already undergone alteration, so that it can no longer be clotted by thrombin.

In the method of preparing serum which was discussed earlier in this paper, there was delay in adding calcium chloride, and in such serum a heavy precipitate subsequently formed. This precipitate is mainly protein in nature, and it is our belief that it derives from fibrinogen which remains in the serum as a result of incomplete clotting of the plasma. According to this hypothesis, fibrinogen—known to be the most labile of the plasma proteins—undergoes progressive changes finally resulting



in precipitation. Since, in our opinion, the precipitate in stored serum consists mainly of altered fibrinogen, it is clearly desirable to remove fibrinogen as completely as possible from the plasma. Addition of calcium chloride at the earliest possible moment after separation of the plasma from the corpuscles should completely remove the fibrinogen, since the thromboplastin content of the plasma will be at its highest level and the fibrinogen will not have undergone any degenerative changes.

#### Alteration of Method of Serum Preparation.

In view of these considerations it was decided to modify the method of preparation described in the beginning of this note, and (a) to clot plasma as soon as possible after obtaining it from the donors and (b) to add "Merthiolate" to the plasma at the time of clotting. Four months after the adoption of this procedure 1,800 litres of serum were examined for turbidity and precipitation. Less than 5% of the samples were slightly turbid, and in some there was a slight precipitate. Prior to the introduction of these changes, over 90% of samples showed both turbidity and heavy precipitation.

#### Acknowledgements.

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### Reviews.

#### A TEXT-BOOK ON TROPICAL DISEASES.

THIRTEEN years have elapsed since the fifth edition of Stitt's handbook on the diagnosis and treatment of tropical diseases appeared, and Professor Richard P. Strong has now published a sixth edition under the title of "Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases".<sup>1</sup>

Admiral Stitt in a foreword introduces and felicitously commends to the medical public Professor Strong, who has been his close friend for almost forty years; he is emeritus professor of tropical diseases of the Harvard University, and since 1941 has been consultant on tropical medicine to the United States Secretary of War.

Professor Strong himself, after stating that knowledge regarding many of the diseases encountered more commonly in tropical countries has been very greatly increased, expresses it as his aim in the two volumes that make up the sixth edition, "to make available a summary of the knowledge not only of the clinical manifestations regarding tropical diseases and their treatment, but also of whatever zoological aspects and laboratory measures are of importance in connection with their transmission, diagnosis and prevention. Also brief consideration has been given to the more important cosmopolitan diseases that may be encountered in war countries." He states also that he has endeavoured to avoid "dogmatic discussions", but has tried to present the available evidence to show differences of opinion where such exist, in order that students may not be led to believe that there is only one point of view. He has appended a brief list of references to each chapter for the reader who wishes more extended information. Moreover, recognizing also that in all progressive countries there is at present a tendency to increase the emphasis which has been placed on the preventive side of medicine, public health practice and sanitary engineering, he has devoted considerable attention to public health problems and has added the word "Prevention" to the previous title.

<sup>1</sup> "Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases", by Richard P. Strong, M.D., ScD., D.S.M., C.B.; in two volumes; Sixth Edition; 1942. Philadelphia: The Blakiston Company. Crown 8vo, pp. 926 (Volume I) and pp. 923 (Volume II), with coloured plates and 395 illustrations. Price per set: \$21.00 net.

In preparing and editing the work for the press, Professor Strong has been assisted by Dr. G. C. Shattuck on nutritional disorders, heat stroke and some aspects of tropical hygiene; Dr. A. W. Sellards on yellow fever; Dr. J. H. Sandground on parasitology; Dr. J. C. Bequaert on the entomological section; Dr. T. R. Barbour on poisonous reptiles, arthropods, fishes *et cetera*; Dr. R. Fitz on blackwater fever; Colonel J. S. Simmons on dengue; and Colonel G. R. Callender in connexion with information regarding instruction and investigation at the United States Army Medical School.

The result of so imposing an array of talent has been the production of a monumental and encyclopedic set of textbooks with the excellences and defects inherent in such a work. Though the earlier editions of Stitt gave admirable advice to those Americans who undertook the control of tropical diseases in the Philippines or Cuba, or the study of tropical diseases in Central and South America and elsewhere, no American text-book on tropical diseases has up to the present attained outstanding repute. Those who remember Stitt's handy pocket manual of a few hundred pages which appeared more than twenty-five years ago as "The Diagnostics and Treatment of Tropical Diseases" will miss the familiar features that endeared it to a generation of medical practitioners often stationed in lonely outposts. It was handy to carry, sufficiently explicit upon the diseases one commonly met, and sufficiently dogmatic as to treatment to relieve one of the responsibility of doing more than following its succinct requirements. Successive editions have materially increased its size, and the two volumes of the sixth edition, which together weigh eight pounds and include approximately 1,800 pages, not only place upon the market a more complete survey of tropical literature than is provided in any other text-book in any European language known to us, but direct this fund of information to the research student and the academic investigator rather than to medical men practising in the tropics.

It is doubtful whether any scientific paper of marked importance published during the last twenty years has missed the eagle eye of Professor Strong and his colleagues. The student will certainly not fail to appreciate the fact that there is no sole point of view in tropical medicine; his difficulty may be that so many and such varied views, in respect of both theory and practice, are so well set out that he may be at a loss as to which to follow.

The excellence of the volume is in a sense a criticism, for anyone but a person already skilled in tropical diseases may be embarrassed by its riches. The descriptions of diseases, and in many instances the treatments, are outlined with meticulous care between commentaries upon different papers and theories. Some of the specific treatises are models of research.

The diseases dealt with in the two volumes are set out in sections in relation to the organisms or deficiencies that set them up, as follows: (a) protozoa; (b) bacteria; (c) filtrable viruses, rickettsiae and allied organisms; proceeding thence to (d) nutritional disorders; (e) diseases not satisfactorily grouped in other sections (these include the acute effects of heat, tropical ulcer, *granuloma venereum*, climatic bubo, and diseases of rare occurrence or of doubtful origin); (f) diseases due to fungi and poisonous plants; (g) diseases due to animal parasites; while an eighth section contains general and specific considerations; and three appendices which include (i) alphabetical index of clinical diagnosis (the feature that gave Stitt's first volume its specific character); (ii) laboratory procedures for diagnosis, indexed by disease; and (iii) tropical and personal hygiene.

The first 135 pages are devoted to a study of malaria—115 to that disease group itself, and 20 pages to its prophylaxis. All those engaged in the present war (and particularly Australians who have always been indifferent to the minutiae of personal prophylaxis and only too ready to rest on the assumption that, since there is no true causal (sporocytocidal) prophylactic against malaria, haphazard measures or none might suffice) should read, mark, learn and inwardly digest pages 126 to 135. Strong, following American opinion, includes among the species of the genus *Plasmodium* pathogenic for man *Plasmodium knowlesi*, a parasite normal to the rhesus monkey. It would appear that this is at least a premature finding according to English observers, who may perhaps question whether such infections occur in nature, with the profound consequences they might imply from the point of view of prevention in certain geographic regions.

In respect of blackwater fever, Strong appears unduly cautious. He states that it is a disease "the etiology of which has been disputed, but there is now general agreement that it is definitely connected with attacks of malaria or

a continuous malarial infection". The relationship between subtertian malaria and blackwater fever is surely sufficiently recognized to merit a more definite statement in this regard. He also states that it is remarkable that physicians failed to recognize this striking condition "until towards the end of the 19th century", which, while it may be consistent with library references, is by no means the case. In fact, the library references themselves of 1850-1860, which he quotes, are hardly dates "towards the end of the 19th century".

The information provided in respect of trypanosomiasis, the leishmaniasis, and relapsing fever is excellent. Strong retains the unsatisfactory and misleading name "infectious jaundice" for leptospirosis. Jaundice is by no means typical of the disease, though, as he states, it "is common" in some epidemics. It is rare in others. In fact, the statement that of the 22 cases which have been reported in the United States, jaundice was found to be the prominent feature in 21 (page 368) indicates inevitably that a much greater number of cases have occurred there and have been missed. It has been the experience in every country where this matter has been investigated that jaundiced patients bring the condition to attention, but that careful inquiry indicates that a very considerable percentage of cases in which jaundice does not occur exist coincidentally. Students are not only prone to imagine that jaundice is the inevitable accompaniment of leptospiral infection, but that the "jaundice" has some immediate relation to the "infectious" feature. The chapter on rat-bite fever is followed by a chapter on "other forms of leptospirosis".

One of the best ranges of photographs in the book illustrates yaws (frambesias), and the chapter itself is excellent, which it well might be, considering of the wide experience of the authors.

The section on protozoa concludes with the dysenteries and these are dealt with in a masterly manner also. Strong has included the recent work on sulphaguanidine, which has wrought such a change in the treatment of bacillary dysentery, and the aspects of prevention are also well discussed. The map showing the areas in which notification of dysentery is compulsory (page 444), however, appears unnecessary. It is taken from a publication of the League of Nations (1935), and with its whites, greys and blacks suggests (until one reads the legend closely) that it indicates the distribution and intensity of dysenteric infections. Admittedly this is incorrect, but the map seems to serve no outstandingly useful purpose.

Speaking of maps, it may be mentioned that those which include this country are generally misleading, doubtless owing to the absence of information about Australia. For instance, at page 6, the distribution of endemic malaria in Northern Australia is not shown. The area shown at page 1299 to indicate endemic filariasis in Australia might reasonably well serve instead to indicate endemic malaria. It is quite inapplicable to endemic filariasis which occurs only along a small portion of the eastern littoral of Queensland and northern New South Wales. A third map, which includes Australia, indicates the presence in this country of widespread leishmaniasis from the Gulf of Carpentaria down to the Tropic of Capricorn, which is quite incorrect.

As a general criticism it may be said that the sections on prevention tend to have an academic rather than a practical flavour. In rare instances also, they show a variance between the views held by the authors of the clinical and the preventive sides. Doubtless a closer association will be developed in later editions.

Proof-reading of so tremendous a work must have been a very great labour, but an undue proportion of errors occurs, particularly in respect of proper and biological names. This is a definite defect. *Hymenolepis* appears in the index only as *Hymenolopsis*, and there are similar instances: Crumpton for Cumpston, Cleveland for Cleland, Inanda for Inada indiscriminately, and a score of others. This should not occur; and it emphasizes also the fact that the selection of authors at the end of each chapter for extra reading has apparently been done largely with a view to American libraries. The selection is not good from the point of view of general tropical medicine. Among other *trivia*, one may note with amusement the statement that "Alcoholic beverages are strictly to be voided until after sundown" (page 1084), which might represent a matter of difficulty!

The books themselves are put up by the Blackiston Company of Philadelphia, and are well printed and well illustrated. An extra advantage is that they are bound in high-grade materials which, as a sticker claims, "are sturdy, germ-proof, and water-resistant—they can be cleaned with soap and water".

Altogether these two volumes are a massive and valuable contribution to the study of tropical medicine, and have

appeared at an opportune time. They will be of considerable assistance to universities and to the headquarters staffs of units engaged in active warfare in many tropical areas.

#### DISEASES OF WOMEN.

THE seventh edition of "Diseases of Women", by ten teachers, has been published.<sup>1</sup> Since the last edition J. D. Barris (who was one of the original ten) and D. W. Roy have retired; D. MacLeod and J. Beattie have replaced them in the team. As Major Frank Cook is serving abroad with the Royal Army Medical Corps, his work as a contributor and editor has been done on this occasion by his colleagues.

Certain difficulties arising from the war made it impossible to arrange meetings at which revisions could be discussed, so this had to be done by circulation of suggestions through the post. As complete a revision as possible, however, has been carried out.

Some alterations have been made in the order in which the chapters are arranged. The section on treatment of most inflammatory conditions affecting the pelvis and urinary tract has been rewritten, owing to the introduction of the sulphonamides. The anatomy of the pelvic organs and the physiology of menstruation have been fully revised, and a simple classification of ovarian tumours and uterine polypi has been introduced. There have also been some alterations in the pictures and diagrams.

When a text-book has reached the seventh edition in twenty-three years, it is evident that the efforts of the original authors, to produce a book which will supply the needs of students and practitioners, have been successful. This book gives concise and accurate information on the common diseases of women, and can be recommended to practitioners who wish to have their knowledge of gynaecological subjects kept up to date. The various subjects are dealt with concisely and clearly, and there is no unnecessary padding. The book is easy to read, and the difficulties that are sure to arise when ten writers combine to produce a composite volume seem to have been very successfully overcome.

#### READY HELP IN TREATMENT.

THE recent appearance of a third edition of Dr. W. Gordon Sears's "Vade Mecum of Medical Treatment" is some indication of its continued popularity with the medical profession.<sup>2</sup> It deals comprehensively yet succinctly with most of the ailments encountered at some time or other in a busy general practice, and quick reference to each subject in the text is facilitated by their arrangement in alphabetical order and by a page index at the back of the book. The information is set out in an orderly manner and is notable for the practical, common-sense attitude adopted in regard to the management of the patient as a psychological as well as a biological entity.

In this handy manual the author gives a clear and concise outline of the orthodox methods of treatment employed by the modern physician, frequently preceded by a brief reference to aetiological factors and diagnostic points which must be taken into consideration before appropriate measures can be applied. Dr. Sears is conservative in his recommendation of drugs to be used in diseases of doubtful aetiology, and wisely utters a word of warning to zealous practitioners who might be tempted to prescribe fashionable and expensive remedies on the sole authority of a specious advertisement.

In a few isolated instances the author's views may not meet with general approval, and the assumption is that the information has been obtained from sources outside his own particular specialty. But that does not detract from the intrinsic value of the book as a ready reference for the student or the general practitioner of medicine.

The last fifty pages contain a useful collection of tables, biochemical tests, diet lists and notes on the sulphonamide group of drugs.

<sup>1</sup> "Diseases of Women", by ten teachers under the direction of Clifford White, M.D., B.S. (London), F.R.C.P. (London), F.R.C.S. (England), F.R.C.O.G., edited by Sir Comyns Berkeley, Clifford White and Frank Cook; Seventh Edition; 1942. London: Edward Arnold and Company. Demy 8vo, pp. 444, with 168 illustrations. Price: 18s. net.

<sup>2</sup> "Vade Mecum of Medical Treatment", by W. Gordon Sears, M.D. (London), M.R.C.P. (London); Third Edition; 1942. London: Edward Arnold and Company. Crown 8vo, pp. 396. Price: 10s. 6d. net.

# The Medical Journal of Australia

SATURDAY, APRIL 3, 1943.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

## THE MENTAL HOSPITALS OF NEW SOUTH WALES.

FOR some years it has been our custom to review in these columns the annual report of the Inspector-General of Mental Hospitals of New South Wales. This has been done for two reasons—in the first place, to acquaint the members of the medical profession with the doings of the department that they may know what facilities are available and be able to form some idea of the treatment likely to be meted out to patients sent by them to departmental hospitals; secondly, to give what backing this journal is able to give to the inspector-general in his unvarying and entirely justified plea for adequate accommodation for patients committed to his care and in his protest against the parsimonious policy of each successive government. It has been said of men that they shall be known by their works; this is as true of Ministers of State as of any other individuals and it is true also of governments in which those ministers hold office. People who live in a democracy have a right to expect that the steps taken to safeguard the health of the community and the provision made for those whose health fails them shall be planned to meet every need as it arises. They also expect that particular care shall be taken of those who cannot help themselves—especially of children, the aged and the mentally ill. These three groups do not receive the same attention at the hands of either the public or the politicians. Children are the most important asset of any State. A strong and healthy child will probably become a strong and healthy man or woman; it is in the interest of the State that the child's health shall be conserved. Moreover, most children have parents who will make some effort to promote child welfare and these parents have a voice in the control of State affairs. Generally speaking the provision made for children by the State is good. Many persons also have a subconscious reason for taking care of the aged—they may live to old age themselves and like to feel that, should they do so,

some provision will be made for them. But no one expects to become mentally ill; there must be few who ever think of such a possibility. Should it become necessary for a relative or acquaintance to be sent to a mental hospital, there is no way in which the average person can satisfy himself that the patient's surroundings are in every way suitable. He cannot visit the wards of a mental hospital and the patient is not always able either to judge of what is adequate or to give an account of himself and of what happens to him. From this general statement it is clear that of those in the community who cannot help themselves the mentally ill may be the most easily neglected—perhaps not of malice aforethought, but through a policy of putting off till tomorrow what it is not convenient to do today. Before the outbreak of the present war there were signs that some of the smaller deficiencies in regard to accommodation in the mental hospitals of New South Wales were to be made good—some much needed work had already been completed. It is but to be expected that during the war only the most urgent work in the construction or improvement of hospitals will be carried out, for the first consideration must be the winning of the war. With this statement in mind the report of the Inspector-General of Mental Hospitals for the year ended June 30, 1941, may be considered.

The report in question was ordered to be printed on November 12, 1942; it was published in March, 1943, almost 21 months after the expiry of the period with which it deals. Departmental reports are nearly always tardy in making their appearance, but the lag on this occasion seems to have been in the drawing up of the document. Dr. E. Sydney Morris's "letter of presentation" bears the date "26th June, 1942". There may be some good reason for the delay, but the lag is unfortunate, for the unwary may gather the impression that the conditions described in the report are those of a much more recent date. The conclusion is also unavoidable that we shall have to wait until March, 1945, before we have an official account of the state of affairs in the Mental Hospitals Department of New South Wales as they are at the present time. This is the first report to be presented by Dr. Morris, who until his appointment as inspector-general of mental hospitals was not directly connected with the Mental Hospitals Department. On the retirement of Dr. J. A. L. Wallace from the office of inspector-general on July 14, 1941, it was decided that the office of inspector-general should be held by the Director-General of Public Health and Dr. Morris took over the office. A deputy inspector-general was appointed from within the ranks of the mental hospitals service. The report presented by Dr. Morris therefore covers the last twelve months of his predecessor's tenure of office. During the twelve months under review there was an increase of 64 in the number of patients as compared with the previous year. Dr. Morris points out that this slight increase in the number of patients does not indicate an increase in insanity in the community. He agrees with the statement made by Dr. Wallace in the previous report that there is no evidence to indicate that in New South Wales the war has caused any variation in the incidence of insanity. It is likely that any statement made by Dr. Morris regarding the last 21 months would be the same. "There is, of course, a severe strain on the stability of many persons . . . but this is more liable to cause or aggravate neuroses, including anxiety states,



and only in a few cases to precipitate an attack of insanity." At the close of the twelve months under review the number of patients, including voluntary patients and inebriates, resident in State mental hospitals was 11,347; permanent accommodation existed for only 9,850, so that the excess number of patients was 1,497. This is the greatest number of excess patients recorded during the last twenty years, but since 1923 the number has always been over 1,000, with the exception of 1933-1934 when the number was 657. It might be supposed that the medical and other officers of the department had become used to such an overcrowded state, but if successive reports of inspectors-general are any criterion, this is not so. And no one can really believe that the best work can be done for patients under such conditions. Dr. Morris mentions the "possible loss to the Department for other purposes for a period" of at least one of his institutions. We understand that one of the institutions has been temporarily closed, so that the conditions of overcrowding must be more acute than ever. Unfortunately it looks as if we shall have to wait till 1945 to read in a report what the present conditions actually are. In previous reports inspectors-general have emphasized the need for the construction of a new mental hospital near the metropolis. Such an institution is needed in the metropolitan area to allow friends and relatives of patients to visit them "at reasonable cost and within a reasonable time". Visiting of this kind, it is claimed, may be of considerable therapeutic value. The suggestion appears justified that it may be possible in this regard to do a little long-range planning. There has been mention in certain quarters recently of hospital construction for the armed forces during wartime being undertaken with some thought of the needs of the days of peace. This should be attempted. If another military hospital should be needed near Sydney, and this is not at all unlikely, it should be possible to construct it in such a way that later on it could, without a great deal of alteration, be transformed into a mental hospital. The idea should be borne in mind and Dr. Morris would receive a good deal of support from medical practitioners were he to let it be known that he was fathering such an idea.

Another point to which attention should be drawn is that discussed by Dr. Morris under the caption "Disposition of Senile Cases". He points out that the care of mental illness in old age involves two factors. From the point of view of sentiment it is unfortunate that senile persons cannot be looked after at home or in an infirmary controlled by the State. From the point of view of mental hospitals such persons take up many beds and the time of a highly trained staff which might better be spent in looking after persons who may recover. Dr. Morris points out that in England persons over seventy years of age, not previously certified as insane, may be cared for in a special section of a London mental hospital, without being certified. "Such an arrangement would meet the requirements of such cases in this State"; at present senile patients are admitted to any of the mental hospitals. The adoption of such a scheme seems only rational, but it would, we should imagine, mean the erection of special buildings. Very much the same kind of suggestion has been made in regard to the erection of "subacute diseases hospitals" to relieve the congested state of general hospitals in and around Sydney.

On the scientific side mention must be made of the experiences in convulsant shock therapy. Dr. S. Evan Jones, of the Broughton Hall Psychiatric Clinic, reports on the results of "Cardiazol" therapy in the treatment of 1,263 patients—674 males and 589 females. He points out that good results have been obtained in several conditions. He states, however, that there are still a large number of schizophrenics who do not benefit from convulsant therapy. He thinks that consideration should be given to the use in these cases of insulin shock therapy or of combined insulin and convulsant therapy. For this purpose he thinks that a special unit should be constituted at one of the metropolitan mental hospitals for the treatment of certified patients. This "would involve the provision of a separate ward or other unit and the appointment of special medical and nursing personnel". This appears to be a question of domestic arrangement and possibly has already been done by Dr. Morris. Discussion on this report cannot be closed without reference to the retirement of Dr. Oliver Latham from the position of pathologist to the department. Dr. Latham's work in neuropathology is so well known in Australia and beyond its borders and his eminence as an authority is so undisputed that further reference is unnecessary. His retirement was a great loss to the department, but scientists throughout the country are happy to know that his appointment to an important position at the University of Sydney will enable him to continue his studies in neuropathology and to put his wide knowledge and experience at the disposal of clinicians and pathologists.

At the risk of repetition this short reference to the report of Dr. E. Sydney Morris on the activities of the mental hospitals in New South Wales for the year ended June 30, 1941, may be concluded with the statement that no one expects impossibilities of such departments in wartime. What is demanded is a proper perspective, and this Dr. Morris will continue to seek. Every right-minded person, whether he is a medical practitioner or not, will back him in any effort that he makes to protect and to treat and generally to better the lot of the one group of persons in the community who are least able to help themselves.

## Current Comment.

### CONTINUOUS SUCTION DRAINAGE.

THE different kinds of apparatus suggested to provide continuous negative pressure are legion, and this, as usual, indicates their individual lack of perfection. Suction pumps driven by electrical or water power are wasteful. A siphon apparatus such as Kidd's U tube has been successfully employed for intermittent suction drainage of the bladder, but is of little value for stomach aspiration; similarly, a Sprengel's pump is unsuitable for the stomach, among its disadvantages being the fact that it soon becomes blocked. A modification of the siphon apparatus devised by Wangenstein a year or two ago has proved the most successful to date in providing a suitable simple suction apparatus for the stomach. This apparatus includes a reservoir of fluid at the top of the siphon; gastric contents accumulate in this reservoir and do not block the apparatus, which will run for many hours without attention.

In conditions in which there is a pathological accumulation of fluid in the stomach, as a result of either exudation

or regurgitation, the value of continuous aspiration of the stomach is at once apparent when the results are observed in even a small series of cases. The improved clinical condition of patients who suffer from acute dilatation of the stomach or paralytic ileus, or who have been operated on for intestinal obstruction, and whose treatment includes continuous aspiration of the stomach, more than compensates for any discomfort caused by the indwelling tube. Incidentally, a small firm tube of the Wangenstein type is probably the most efficient for this purpose; it is least uncomfortable if it is inserted through the nose after being lubricated by liquid paraffin and if the portion remaining in the nose is smeared with "Vaseline". Perhaps it is superfluous to mention that continuous gastric aspiration should not be used without the simultaneous parenteral administration of fluids to maintain the fluid balance.

Continuous suction has been used also for the treatment of *empyema thoracis*, and pancreatic and other fistulae; but, apart from the fact that it keeps the stomach empty, the greatest value of this method is in association with lesions of the bladder. That tidal drainage of the bladder is not employed more frequently may be regarded as evidence that its value is not fully appreciated or that the indications for its use are not clearly understood. These indications have been ably summarized by W. Cone and W. H. Bridgers<sup>2</sup> as follows:

(i) to prevent the occurrence of infection; it is certainly a life saving measure in "neurological" bladders. (ii) to increase the capacity of a contracted fibrotic bladder by progressively increasing the height of the siphon tube over a period of weeks. (iii) to control infection of primary cystitis after oral therapy has failed. (iv) it may be used when an indwelling catheter or repeated catheterization is indicated, with the advantages that the antiseptic solution (normal saline or Ringer's solution with dissolved sulphonamides) is almost continuously in contact with the bladder walls, and that it will not allow the progressive contracture of the bladder which occurs with an indwelling catheter draining away continuously.

For the bladder the problem of providing a suitable apparatus is somewhat different from that for the stomach, since an apparatus that irrigates and empties the bladder intermittently is required. Again, many have been suggested, but that of Cone and Bridgers would appear to be more suitable than most. This apparatus and its use are fully described in their paper to which the reader is referred for details. The value of tidal irrigation in the treatment of the paralysed bladder associated with spinal injuries alone constitutes sufficient reason for the addition of such an apparatus to the surgical armamentarium and for the more frequent use of this method in this most troublesome condition.

#### IRRADIATION EFFECTS.

THE recent death of one of the first technicians in Ernest Harnack's X-ray department of the London Hospital has recalled the tragic fate which befell so many of the X-ray pioneers. Few of them escaped severe damage by the rays, the beneficial effects of which they were investigating. These bitter experiences have led to the development of a strict code of precautionary measures, and this has reduced untoward effects to a minimum. Still, in the treatment of malignant tumours certain risks will have to be taken; at the same time it is certainly distressing if irreparable damage or even a carcinoma results from irradiation for a benign condition. And if it is necessary to apply irradiation to an organ which has a strong inherent tendency to develop malignant neoplasms, the question in what circumstances one is justified in the use of such therapy will have to be asked over and over again.

A study by L. C. Schifney<sup>3</sup> deals with this subject. The series he reports consists of 20 uterine malignant neo-

plasms (7 carcinomata of the cervix, 12 carcinomata of the fundus and 1 myosarcoma) which developed in patients who had previously received irradiation for a benign condition. After carefully analysing each individual case he arrives at the conclusion that errors of omission either in technique or in judgement and not the irradiation therapy itself were responsible factors in the subsequent occurrence of a malignant neoplasm.

The five speakers who took part in the discussion on the paper likewise expressed the opinion that careful irradiation for a benign condition does not increase the risk of subsequent development of a carcinoma. They stressed the point that a number of such alleged occurrences were due to incomplete investigation at the time of the original treatment and advocated a very thorough examination of the patient and the performance of a curettage or biopsy before any such treatment was instituted. It is, however, noteworthy that one of the speakers stated that he had abandoned intrauterine radium treatment for benign conditions in favour of X-ray therapy. The statement therefore seems justified that on the basis of our present knowledge irradiation treatment carries no undue risks and that untoward results arise from errors of judgement, from faulty technique or because they are unavoidable, as in the treatment of some cases of carcinoma.

A related question, however, still remains unanswered, the question whether irradiation therapy may be applied to the pelvic organs during a pregnancy. Impressed by such statistics as those published by Murphy in 1929, showing that of 74 fetuses heavily irradiated before birth and born at term, 25 had congenital malformations (17 of the 25 children were microcephalic idiots), many hold the view that irradiation of the fetus should be avoided altogether. This is not to say that diagnostic procedures like X-ray pelvimetry should be abandoned, for such exposures are harmless. But if, for example, carcinoma of the cervix is discovered during pregnancy, the pregnancy should, according to such opinion, be terminated and the carcinoma then dealt with in the usual manner. It may, however, not always be possible to obtain the consent of the patient to such a measure. Proper management in such cases will sometimes succeed in preservation of the pregnancy, as well as in the cure of the carcinoma, as a case history from an Australian metropolitan hospital shows. A woman was found to have a carcinoma of the cervix when six months pregnant. Irradiation therapy had to be instituted, and in order to minimize damage to the fetus the resident medical officer performed an external version every six hours during the course of the treatment. A normal child was born at term. It now attends school and is in no way different from other children of the same age. The mother, after having been cured of her squamous cell carcinoma of the cervix, four years later developed an adenocarcinoma of the fundus which in turn was removed by hysterectomy.

Although it can be seen from the literature that common agreement about irradiation of a pregnant uterus has not yet been reached, a divergence of opinion can be no excuse for the management of a case which is reported by D. P. Murphy, M. E. Shirlock and E. A. Doll.<sup>4</sup> The only condition of the patient requiring "treatment" was pregnancy. A series of irradiations was actually given to procure an abortion. The desired result was not achieved, the pregnancy went to term and a microcephalic child was born which at the age of fourteen and a half months had reached a development comparable only to that of a child of five and a half months. A careful analysis of the family history (the woman had given birth to four normal children prior to and one normal child after the incident) provides strong evidence that the state of the child was directly attributable to the irradiation. Although implying only condemnation of the method as such, the authors insist very strongly that whenever irradiation for this purpose should not result in the death of the fetus, the pregnancy should be terminated by some infallible means.

<sup>1</sup> *Surgery, Gynecology and Obstetrics*, July, 1942.

<sup>2</sup> *American Journal of Obstetrics and Gynecology*, December, 1942.

<sup>3</sup> *The American Journal of Roentgenology and Radium Therapy*, September, 1942.

## Abstracts from Medical Literature.

### DERMATOLOGY.

#### Sensitization.

R. L. BAER (*The New York State Journal of Medicine*, August, 1942) states that by allergic contact-type eczematous dermatitis is meant that form of eczematous dermatitis in which the eczematous reaction is brought about by an allergic hypersensitivity of the skin to an agent which in the same concentration and under similar conditions does not cause any cutaneous irritation of the skin in the majority of similarly exposed, but not previously sensitized individuals. The reaction thus elicited is allergic in nature. This specifically acquired hypersensitivity may develop after the first exposure. It is most likely that the epidermis, the non-vascular layer of skin, is the main stock tissue in this form of allergic hypersensitivity. The author discusses allergies in industrial eczematous dermatitis and mentions that the quantities of potential sensitizing substances necessary to elicit a reaction are usually in an entirely different—that is, a much smaller—category from those quantities necessary to elicit primary irritant or toxic reactions. Another important factor is the frequency and regularity of exposure. The regularity of exposure is probably one of several mechanisms by which so-called "hardening" is produced in the skin of some workers. The mechanism of this form of hardening is not known. The author then discusses host factors in industrial eczematous dermatitis, and amongst these mentions individual differences in the thickness of the horny layer of the exposed parts of the skin and excessive dryness of the skin which is encountered in hypothyroid states and in vitamin A and vitamin B complex deficiencies. In the latter group also belong those individuals who, through excessive bathing and excessive use of soaps, either create or increase a tendency to dryness of the skin. Other factors mentioned are excessive moisture of the skin, through repeated wetting or in hyperidrosis, which increases the tendency to industrial dermatitis, and the oily skin of seborrhoeic subjects whose skin facilitates the introduction of oily substances into the cutaneous tissues. The author mentions the fact that trauma such as that caused by constant friction, burns, cuts *et cetera* permits an increased amount of allergen to penetrate into the shock tissue, and frequently trauma offers the portal of entry for infective microorganisms. The author then discusses "proof of sensitization". In this section he stresses the need for an accurate history. The clinical appearance of the dermatitis must be thoroughly studied. The lesions must conform clinically to the well-known signs of an eczematous dermatitis, which may present itself in any stage—from an acute, oozing, vesicular, papular, erythematous dermatitis, to a chronic, lichenified, dry, fissuring, scaly dermatitis, at times accompanied by hyperpigmentation. Other eruptions simulating contact types of dermatitis must be carefully differentiated; among them atopic

dermatitis, seborrhoeic dermatitis, dermatitis herpetiformis, psoriasis, herpes simplex, and particularly nummular eczema. The localization of the contact-type of eczematous dermatitis should, as a rule, correspond to the site of maximum exposure in a wide sense. If clinical inspection and a careful history do not lead to the discovery of the cause or causes of the dermatitis, patch tests should be performed with suspected substances. The author also states that all possible hygienic and protective measures should be taken which might help in the prevention of sensitization. These include selection of proper cleansing agents for workers, protective clothing *et cetera*. Protective creams where possible should be used.

#### Dermatological Experiences with the British Expeditionary Force.

J. T. INGRAM (*The British Journal of Dermatology and Syphilis*, August-September, 1942), discussing experiences with the British Expeditionary Force, states that the clinical material essentially consisted of scabies and impetigo. The simplicity of dermatology becomes over-emphasized in wartime, and it is not difficult for any medical officer—army or civilian—to grasp the essentials of the major part of the work easily and quickly if he has the will. Seborrhoeic troubles naturally occurred, but were not unduly in evidence. The author states that many will attribute this to the good feeding of the troops, though he would lay some emphasis at least on the absence of the continuous nervous and physical stress and strain which characterized the war of 1914-1918, and the absence of dirtiness and lousiness. Cases of seborrhoeic eczema following treatment of scabies described in the last war were not seen, though cases of sulphur dermatitis were naturally encountered. Other affections of some importance were cases of eczema, pompholyx, *tinea cruris* and boils of the forearms. In scabies the outstanding feature was the presence of inflamed, indurated, discrete papules set like studs round the points of the elbows and knees, anterior axillary folds, genitals and folds under the buttocks, with infrequent affection of finger clefts and wrists. The author does not know what the significance of the papules in a scabious eruption may be; he thinks they are not merely infected burrows and they do not proceed to pustules and pyoderma. As has always been the author's experience, sulphur ointment, used in treatment, did produce a high percentage of cases of skin irritation, whereas when for periods at many units benzyl benzoate was employed, excellent results and no skin irritation occurred. The essential difficulty in the treatment of scabies lies in getting the treatment carried out according to instructions. In the treatment of impetigo and pyoderma, the guiding principle was to avoid ointments and to keep the skin dry; results were generally good. Solutions of dyes were used, or Eau Dalibone followed by dusting powder or calamine, ammoniated mercury 2% in Farrar's paste where practicable, permanganate compresses, or starch poultices *et cetera*. The author mentions the use of dithranol ("Cignolin") two grains in Lassar's paste one ounce for the treatment of *tinea cruris* and

the use of permanganate of potash baths 1 in 4,000 for widespread infected and weeping dermatoses both for local and general affections.

#### Use of Sulphanilamide and its Derivatives in Ointment Form.

J. L. MILLER (*Archives of Dermatology and Syphilology*, September, 1942) has treated 115 patients in an out-patient clinic during the past year with sulphanilamide and its derivatives. The preparations used were sulphanilamide, sulphathiazole, sodium sulphathiazole and sulphadiazine in strengths varying from 5% to 50%. They were incorporated in two different bases, which were essentially water in oil emulsions. The base most frequently used contained diethanolamine oleate, white wax, liquid petrolatum, white petrolatum and distilled water. The dermatoses treated were (a) primary infections of the skin, (b) diseases of the skin with secondary pyogenic infections, and (c) miscellaneous diseases. Cure was obtained in all patients with superficial pyogenic infections whether primary, such as impetigo and ecthyma, or secondary, such as those occurring in allergic eczema, psoriasis and dermatophytosis. In more deeply seated infections, however, these ointments were less effective, probably because of their limited ability to reach the seat of the infection. The results of treatment in pustular acne and seborrhoeic dermatitis were inferior to those obtained with accepted methods of treatment. Two severe reactions occurred with 50% sulphathiazole ointment, but no severe reaction with 5%. Sulphanilamide seemed to be as effective as sulphathiazole ointment in the treatment of patients infected with *Staphylococcus aureus*. A 5% concentration of each drug was found just as effective as higher concentrations and less productive of reactions.

#### Skin Irritants.

E. D. OSBORNE AND J. J. HALLETT (*The New York State Journal of Medicine*, August 15, 1942) quote the definition of "primary skin irritant" as formulated by a combined Committee on Industrial Dermatoses. This definition is as follows: "When a substance in a given concentration, in a given vehicle, and in a given manner and length of exposure produces a clinically manifested irritation of the skin of a majority of persons not previously sensitized to that substance, that substance is a primary irritant under the specified condition. This irritation may be redness, papulation, vesiculation, ulceration or other sign of damage at the site to which the substance has been applied. By contrast, substances which produce reaction only on the skin of persons who are hypersensitive to that substance are not primary irritants. A sensitizing agent is one which increases the capacity of the skin to react to subsequent exposure." The committee also called attention to certain circumstances which might enter into the irritant action of any specific chemical substance, as follows: 1. The region of the cutaneous surface exposed. 2. The physiological state of the skin with reference to the degree of oiliness, of perspiration and of pigmentation. 3. The skin of the white race in comparison to that of the black,



brown and yellow races. 4. The action of two substances in combination, each of which alone does not exert an irritant action. 5. The size of the area exposed to irritation. 6. Whether the area exposed to the irritant is subsequently covered or exposed to air. 7. The general state of health, including the emotional background. 8. The influence of season, diet and actinic rays. The authors state that from now on the term "skin irritant" or primary skin irritant should be limited to those substances which produce primary irritation of the skin and that the term "allergen" should be reserved and constantly used for those substances which produce the reaction to sensitivity. They also state that properly performed patch tests have been discredited because some other physician reported a positive test with a primary irritant. Physicians who test and diagnose industrial dermatoses should have a clear idea of the difference between primary irritants and allergens, and a ready knowledge of the proper dilutions of chemical substances for patch testing is important. The authors reproduce three charts. Chart I gives the clinical features of primary irritation as contrasted with the reaction of sensitization. Chart II gives a list of the most common skin irritants, and Chart III a list of common skin irritants that frequently induce hypersensitivity. Continued contact with these primary irritants should be prevented.

## UROLOGY.

### Ureteric Spasm.

T. A. LAZARUS AND M. S. MARKS (*The Journal of Urology*, July, 1942) state that while the subject of ureteric stricture has for years occupied a prominent place in urological literature, spasm has attracted only scant attention. Yet experience indicates that spasm plays a greater role as a cause of urological symptoms. It may occur spontaneously, or is associated with, or initiated by, a variety of conditions, among which ureteric calculus is the most common. It may occur in one or both ureters, either as a primary condition or as a secondary manifestation from some source of irritation which may be present on one or both sides. Contralateral spasm may occur when an obstructive organic disease is present on the side opposite to that of the spasm. Relief of the obstruction usually results in disappearance of the spasm on the opposite side. A powerful drug for the immediate treatment of the spasm is insulin-free pancreatic tissue extract ("Depropanex" made by Sharp and Dohme, United States of America), the dose being 1.5 cubic centimetres given intramuscularly. The effect may be enhanced by calcium gluconate given intravenously.

### Gastro-Intestinal Disturbances in Renal Disease.

S. WEISS (*Urologic and Cutaneous Review*, April, 1942) discusses gastro-intestinal disturbance in renal disease from the standpoint of a gastro-enterologist, and states that if the clinician fails to recognize when digestive disturbances are due, not to the stomach or intestine itself, but to a renal lesion, his therapy will be useless. The reno-gastric reflexes may be

motor, secretory or vasomotor in type. Also, absorption of toxic products due to disease of the kidneys may cause gastro-intestinal disturbance, and vice versa. Careful examination of the genito-urinary organs and also chemical examinations of the blood should be made in all difficult alimentary tract cases. Thus, chronic diffuse renal arteriosclerosis may be followed by cardiac decompensation, passive congestion of the digestive tract and enlargement of the liver with secondary gastric symptoms. Surgical renal disease, associated with infection, may first show up in the form of pronounced digestive disturbance. Right-sided renal pain, especially associated with renal ptosis, is frequently confused with appendix and gall-bladder trouble. It must not be forgotten that the renal lesion itself may be only secondary to a primary cause lower down in the urinary tract, such as prostatic obstruction or urethral stricture; it is a far cry from these distal sites to the upper part of the abdominal portion of the alimentary tract.

### Hypertension in Unilateral Renal Disease.

A. HYMAN AND N. C. SCHLOSSMAN (*The Journal of Urology*, July, 1942) have studied data obtained from 193 patients who were subjected to nephrectomy for unilateral renal disease. They found that the mean blood pressure and incidence of hypertension were no greater in this group than in a comparable control series of patients. No correlation was noted between the type of renal disease and the presence of hypertension. After removal of the diseased kidney, the blood pressure level remained essentially unchanged in the majority of patients, whether hypertensive or normotensive before operation. Of patients with normal pressure before operation 24% developed hypertension after operation. A significant decline in blood pressure occurred in only 7% of the subjects who had hypertension before nephrectomy. Arterial sclerosis was found in the diseased kidney in 82% of hypertensive patients, and in only 33% of subjects who were normotensive at operation but developed hypertension later. The authors conclude that, when unilateral renal disease and hypertension coexist, removal of the diseased kidney is not likely in the majority of cases to result in a reduction of blood pressure. Indication for nephrectomy rests rather on the nature of the renal disease than on any expectation of lowering blood pressure.

### Active Renal Tuberculosis.

For the alleviation of intractable vesical tuberculosis due to active renal lesions, F. H. COLBY (*The Journal of Urology*, October, 1942) finds that cutaneous ureterostomy is the most satisfactory treatment. He believes that much criticism of this method arises from the high incidence of stricture formation at the site of the cutaneous opening or from the use of indwelling ureteric catheters to prevent these strictures. He avoids both these difficulties by a simple technical manoeuvre. When the ureter is divided the vesical end is carbolized and ligated. The proximal end is clamped and brought out of the wound, which is then closed without drainage. A catheter is passed into the ureter, the redundant portion of which is split

on two sides. These portions are then turned back and sutured to the skin margin. This results in a good rosette of mucosa protruding from the wound and prevents cicatricial stricture formation. The catheter is not left *in situ* after operation. The patient is kept clean and comfortable by wearing a simple and inexpensive colostomy bag.

### Treatment of Ruptured Bladder and Urethra.

HAVING reviewed 86 cases of ruptured bladder and urethra at the Brady Urological Institute, O. S. CULP (*The Journal of Urology*, September, 1942) makes the following recommendations. In rupture of the bladder a retrograde cystogram should be prepared whenever rupture is suspected but not obvious. Physical signs alone are disastrously misleading. Prompt operation, preferably within two hours of extravasation, is imperative. No patients recovered without operation, nor with urethral catheterization alone. Operation should consist in routine exploration of the peritoneal cavity, cystotomy, and drainage of perivesical tissues at the base of the bladder. The most common cause of death was unexplored peritonitis. Retroperitoneal extravasation was encountered frequently, but rarely drained adequately. Repair of the bladder wall is desirable, but not essential. Rupture of the posterior part of the urethra must be suspected in all fractures of the pelvis. Cystourethrograms should be made in all doubtful cases. Suprapubic drainage (within four hours if possible) should be a routine procedure. Inadequately drained extraperitoneal extravasation was the most common cause of death. Perineal repair or retrograde catheterization facilitates recovery. Anterior urethral perforations are most often caused by sounds. All peri-urethral abscesses should be drained because of the likelihood of inflammatory perforations and extravasation. Extensive drainage of the extravasated areas and adequate urinary drainage should be provided within twenty-four hours. Perineal urethrotomy and suprapubic cystotomy (with or without retrograde catheterization of the urethra) are most valuable. Combined anterior and posterior rupture should be suspected in all perforations near the triangular ligament. Suprapubic drainage should be instituted if any doubt arises about pelvic involvement. Sulphonamides should be given by mouth and applied locally in all cases. Fluids should be given by the intravenous route to prevent uræmia and acidosis, which are frequent complications.

### Citrate Buffers for Urinary Tract Lithiasis.

I. G. HODGE, B. L. HALLYAR AND R. A. WAY (*The Journal of Urology*, August, 1942) present a series of citrate buffer solutions which may be used in the presence of high pH values without painful irritation to the mucous membrane of the urinary tract. The solutions are all isosmotic with body fluids and vary in hydrogen ion concentration from pH 3.5 to pH 6.0. Their use is advocated in such conditions as alkaline encrusted cystitis, nephrostomy with calculus formation *et cetera*. The solutions with the highest acidity are most effective, but the maximum practical acidity is governed by the tolerance of the patient.

## Medical Societies.

### MELBOURNE PÆDIATRIC SOCIETY.

A MEETING of the Melbourne Pædiatric Society was held late on September 9, 1942, at the Children's Hospital, Carlton, Melbourne, Dr. H. L. STOKES, the President, in the chair.

#### Diaphysial Achalasia.

DR. H. DOUGLAS STEPHENS showed a female patient, aged fifteen years, whom he had had under observation for over eleven years. In January, 1931, the child was brought to him because of swellings about the ends of the long bones of the upper and lower limbs and also of the bones of the hands and feet. He had also noticed a swelling under the left breast and wart-like hemorrhagic growths in the right axilla. As the mother had died two years earlier and the grandmother was rather indefinite and ill-informed, Dr. Stephens had not obtained a reliable past history; but it was stated that the deformities had not been present before the child reached the age of three years. The skull, heart, lungs and abdominal viscera all seemed to be normal from the clinical aspect.

In 1932 the patient had a profuse hæmorrhage from the hæmangioma in the right axilla. Dr. Stephens had excised it, and the pathologist had reported that it was a papilloma with much inflammatory swelling. A year later the child sustained a fracture of the left femur, which united fairly quickly with rest and traction. After a further three years, she suffered from painful vulval swellings of a warty nature, which had a distinct tendency to bleed. There were other similar swellings on the sole of one foot and on the back of the tongue, and the lump about the left breast had increased to about the size of a tennis ball; it was tender and was attached deeply, but the skin was not involved. Irradiation therapy proved ineffective, so Dr. Stephens removed the large tumour, and with the aid of diathermy, most of the small ones. At that stage the blood calcium content was estimated at 12.5 milligrammes per hundred cubic centimetres and the phosphorus content at 4.5 milligrammes. The tumours were non-malignant, the pectoral one being classified as a lymphangioma and the others as angiomata.

In the meantime the bony growths had progressed apace, causing gross deformities with torsion and shortening. Signs of mottled calcification had appeared in the dorsal and lumbar vertebræ, as well as some rarefaction of the vertebral border of the left scapula. A peculiar radiating appearance of the iliac bones was obvious on the X-ray films; but the skull bones were unaffected.

Dr. Stephens went on to say that at various times there had been further development of painful angiomatous lesions in the feet, and that the child had suffered repeatedly from severe epistaxis. In 1940 she again sustained a fracture of the left femur, and it had taken much longer to unite than the previous fracture. Though some of the cells of the polymorphonuclear series were pronounced immature, the results of a leucocyte count made then were within normal limits; in other respects the blood examination, including subjection of the serum to the Wassermann test, gave normal results. The calcium content of the blood was estimated at 11 milligrammes per 100 cubic centimetres, the phosphorus content at 5.3 milligrammes, and the phosphatase content at 10.2 milligrammes.

Dr. Stephens then said that he had not seen the girl again until recently. Despite her severe deformity, she had been doing typewriting and other clerical work and her health had been good. She had consulted him on account of pain from multiple warty angiomata on the feet. He had taken the opportunity to obtain a new series of skiagrams, and he showed these together with the original ones taken eleven years earlier. They represented the most widespread example he had seen of deformities arising from disturbance of endochondral ossification of bones formed in cartilage. The association with hæmangiomatous tumours in the soft tissues and in the skin was unusual, but had been mentioned in the literature. They were ascribed by some observers to disturbances of the sympathetic nervous system. A case of Ollier's disease complicated by unilateral calcified angioma and goitre had also been recorded.

#### Mediastinal Hydatid Cyst.

DR. J. G. WHITAKER showed X-ray films and gave an account of a case of hydatid cyst in the chest of a child aged five years. From the radiograms it was predicted that

the cyst would be found in the basal portion of the right lung; but at the operation Dr. Whitaker had encountered almost insuperable difficulty. He had made matters considerably worse for himself by carrying out the usual procedure of fixation of the visceral pleura to the parietes. Fortunately, in the depth of the operative wound he had seen the glistening of the cyst wall and had removed it from the lower part of the mediastinal space *secundum artem*.

#### Thyroidectomy.

Dr. Whitaker also showed a girl, aged thirteen years, whom Dr. J. W. Grieve had brought to the notice of the members a few months earlier because of severe toxic symptoms arising from a goitrous swelling in the neck. In the meantime she had received surgical treatment at the hands of Dr. Whitaker. He had performed partial thyroidectomy and she had made gratifying clinical improvement.

#### Reversion to Evening Meetings.

DR. STOKES, the President, having given previous notice, raised the question of reversion to evening meetings. He contrasted the excellent attendance and interest displayed at the August meeting, which was held in the evening, with the comparatively small attendance and restricted opportunity for suitable discussion and presentation of the wealth of clinical material available at the hospital when the meetings were held in the afternoon. He mentioned that lighting restrictions on motor cars and on buildings had been lessened and that members were hard put to it to make the time available for attendance in the afternoon. Several other members supported the President, and it was ascertained that, without dissent, those present agreed with him. It was announced, therefore, that future meetings would be held at the usual evening hour on the second Wednesday of the month.

## National Emergency Measures.

### NATIONAL SECURITY (SUPPLEMENTARY) REGULATIONS.

#### The Notification of Dengue Fever.

THE following amendment of the National Security (Supplementary) Regulations was proclaimed in the *Commonwealth of Australia Gazette*, Number 39, of February 18, 1943.

The National Security (Supplementary) Regulations are amended by adding at the end thereof the following regulation:

"92.—(1.) Every medical practitioner shall forthwith notify, to the Chief Health Officer in the State in which the case occurs, the first case of dengue fever attended by him after the commencement of this regulation, and shall furnish with the notification such particulars of the locality in which the infection originated as are reasonably ascertainable by the medical practitioner.

"(2.) The notification shall be made by telephone or collect telegram, or, if neither of those means is available, by the most expeditious means possible.

"(3.) When, in pursuance of sub-regulation (1.) of this regulation, a medical practitioner is required to notify a case of dengue fever, he shall thereafter, until he is notified in accordance with this regulation that reports are no longer required, furnish, once in each week, to the Chief Health Officer a statement of the number of new cases of dengue fever which he has attended during that week, or, if there are no new cases, a notification to that effect.

"(4.) Upon the receipt of a notification in pursuance of sub-regulation (1.) of this regulation, the Chief Health Officer shall forthwith notify to the Deputy Director of Medical Services at the Headquarters of the Lines of Communication Area concerned particulars of the locality in which any case of dengue fever is first reported, and shall furnish a weekly report to that Deputy Director of Medical Services of the total number of cases of dengue fever which have been reported to him during the preceding week and the locality in which each case occurred.

"(5.) As soon as the Chief Health Officer is satisfied that it is no longer necessary to require reports from medical

practitioners in any area, he shall notify the medical practitioners in that area that reports are no longer required.

"(6.) In this regulation—

'collect telegram' means a telegram the cost of the transmission of which is paid by the receiver;

'the Chief Health Officer' means—

- (a) in relation to the State of New South Wales—the Director-General of Public Health;
- (b) in relation to the State of Victoria—the Chief Health Officer;
- (c) in relation to the State of Queensland—the Director-General of Health and Medical Services;
- (d) in relation to the State of South Australia—the Chairman of the Central Board constituted under the Health Act, 1935-1936, of that State;
- (e) in relation to the State of Western Australia—the Commissioner of Public Health; and
- (f) in relation to the State of Tasmania—the Director of Public Health.

"(7.) This regulation shall not apply in any Territory of the Commonwealth."

#### NATIONAL SECURITY (MEDICAL CO-ORDINATION AND EQUIPMENT) REGULATIONS.

##### The Sale of X-Ray Tubes.

THE following statement is published at the request of the Chairman of the Medical Equipment Control Committee.

Conditions have been imposed upon the sale of X-ray tubes under the terms of an order issued today (March 9, 1943).

When an X-ray tube is required as a replacement for a broken tube, the purchaser must supply the vendor with a declaration to this effect. In cases in which the X-ray tube is required for some other purpose, permission must be obtained from the Chairman of the Medical Equipment Control Committee before a sale can be made. X-ray tubes are not manufactured in Australia and are in short supply in other parts of the world. It is therefore imperative to exercise control over the distribution of these tubes without interposing unnecessary and time-wasting restrictions when a tube is required urgently as a replacement.

The order is as follows:

(1) A person shall not sell an X-ray tube unless he has received from the purchaser—

- (a) a permit in writing granted by the Chairman of the Medical Equipment Control Committee authorizing the purchaser to purchase the tube, or
- (b) a declaration in writing signed by the purchaser that the tube is immediately required for the replacement of an irreparably damaged tube forming an essential component of an X-ray machine already in operation.

(2) This paragraph shall apply to an X-ray tube, whether sold separately or as part of an assembly or as part of a complete unit.

(3) Any person who sells an X-ray tube shall retain the declaration furnished under this paragraph, and shall, if so required, deliver it to the Medical Equipment Control Committee or an authorized officer.

(4) A person shall not make a false statement in any declaration furnished under this paragraph.

##### Control of Drugs.

The following statement is published at the request of the Chairman of the Medical Equipment Control Committee.

The supply of bismuth, colchicum, colchicine, ipecacuanha and creosote has been controlled by a medical equipment order issued today (March 9, 1943) which provides that they will be supplied only upon the receipt of a medical prescription, except when a permit has been given by the Chairman of the Medical Equipment Control Committee for their use in other ways.

This proviso has been inserted in the order to avoid hardship in cases in which the drugs in question have already been made up into various compounds and are ready for sale.

It is the duty of the Medical Equipment Control Committee to exercise close supervision over the stocks of essential drugs and to control sales by orders of this type

when it seems necessary to do so on account of difficulties of supply. Other essential drugs have been placed under similar control by orders issued during the past two years.

The order is as follows:

In pursuance of regulation 42 of the National Security (Medical Co-ordination and Equipment) Regulations, I, Samuel Roy Burston, Chairman of the Central Medical Co-ordination Committee, acting upon the recommendation of the Medical Equipment Control Committee, do hereby order as follows:

1. After paragraph 5 of the Control of Medical Equipment Order the following paragraph is inserted:

##### Restrictions on Sale and Use of Certain Drugs.

"5A.—(1.) A person shall not sell any of the drugs specified in the Third Schedule to this Order except on the written prescription of a registered medical practitioner, a registered dentist, or a registered veterinary surgeon issued in the ordinary course of his practice:

Provided that nothing contained in this paragraph shall preclude the sale of any drug so specified by a wholesale druggist in the normal course of wholesale dealing—

- (a) to a registered medical practitioner, a registered dentist or a registered pharmaceutical chemist for use in the ordinary course of his practice or business; or
  - (b) upon the written order of a person in charge of a hospital or Government department or institution.
- (2.) A person shall not use any of the drugs specified in the Third Schedule to this Order in the manufacture or preparation of any medicine except—
- (a) on the written prescription of a registered medical practitioner, a registered dentist, or a registered veterinary surgeon issued in the ordinary course of his practice; or
  - (b) under the authority of a permit granted by the Chairman of the Medical Equipment Control Committee.

##### Third Schedule.

2. The following Schedule is inserted after the Second Schedule to the Control of Medical Equipment Order:

##### "THE THIRD SCHEDULE.

##### List of Drugs the Sale or Use of which is Restricted under Paragraph 5A.

Bismuth and salts of bismuth;  
Creosote (medicinal);  
Colchicine;  
Colchicum;  
Ipecacuanha."

Dated this fifth day of March, 1943.

(Signed) S. ROY BURSTON,  
Chairman, Central Medical  
Co-ordination Committee.

## Naval, Military and Air Force.

### APPOINTMENTS.

THE undermentioned appointments have been promulgated in the *Commonwealth of Australia Gazette*, Number 59, of March 18, 1943.

#### CITIZEN NAVAL FORCES OF THE COMMONWEALTH.

##### Royal Australian Naval Reserve.

*Appointments.*—Anthony Owen Parker and Colin Sergeant Richards are appointed Surgeon Lieutenants, dated 21st January, 1943, and 25th January, 1943, respectively.

### CASUALTIES.

ACCORDING to the casualty list received on March 26, 1943, Lieutenant-Colonel H. R. Pomroy, A.A.M.C., Fitzroy, South Australia, is reported to have died of illness.



## Correspondence.

### THE FUTURE OF MEDICAL PRACTICE.

SIR: The attention of my committee has been directed to the publication, in your issue of January 30 last, of a letter signed by C. A. F. Clark, Newcastle. In this letter Dr. Clark states:

After an interview with the Parliamentary Joint Committee on Social Security I am alarmed at the future prospects of the medical profession. The salaried system of nationalization was the only one discussed, with particular reference to the National Health and Medical Research Council's scheme.

Dr. Clark's evidence was, according to the usual practice, given on oath. I have carefully read the proof as corrected by him and I find in it no justification whatever for his remarks quoted above. It is true that when the Social Security Committee visited Newcastle, the proposals of the National Health and Medical Research Council for a salaried medical service represented an important part of the evidence before us, and the committee would have been failing in its duty not to invite evidence upon it. But to suggest that the committee's interest and questioning was limited to a salaried service and that it was already prejudiced in favour of such a service, is completely untrue and unjustified.

The fact is that no decision whatever on any major aspect of medical or hospital services has been made by my committee, nor, so far as I am aware, have members individually or collectively expressed any decisive views on the matter. The committee has kept an open mind and is definitely against any hasty conclusions on matters of such great importance to the medical profession and to the people of Australia.

It is regrettable that while my committee has established and desires to maintain good relations with the President of the B.M.A. Federal Council, Sir Henry Newland, and with its Secretary, Dr. John Hunter, and representatives of the profession generally, throughout this inquiry, letters of the type referred to only create mistrust and misunderstanding and do a disservice to the profession and the community.

Yours, etc.,

H. C. BARNARD,  
Chairman.

Parliamentary Joint Committee on Social Security,  
House of Representatives,  
Canberra.

March 22, 1943.

SIR: Dr. Groves's letter in your issue of March 6 was most apposite. The general failure, outside major teaching hospitals, to obtain post-mortem examinations means a lamentable loss of opportunities to advance both pathological knowledge and the precision of clinical diagnosis. The clinician will study a patient for weeks, months or years, puzzle over his symptoms and signs, instigate all kinds of laboratory and X-ray investigations; then when his patient dies and the perplexities of the case could be so simply solved, nine times out of ten the evidence is buried in the earth or destroyed by fire.

He who shall be instrumental in effecting a simple piece of legislation, permitting a medical practitioner to require a post-mortem examination before certifying the cause of death in any case in which he deems this desirable, will be one of our greatest, though probably unrecognized, benefactors. Such legislation would do two things of enormous and far-reaching value in the health of the community: (i) It would do more than any other measure to improve diagnosis and the general efficiency of medical practice; all competent doctors would be glad to avail themselves of this simple and final court of appeal in their difficult cases. They would learn from, instead of burying, their mistakes, to the benefit of all their future patients. (ii) Such legislation would greatly enhance the accuracy of the registered causes of death and so give the Registrar's figures a statistical value which for many purposes they now sadly lack. Any pathologist in a large general hospital knows that mis-diagnoses in many kinds of internal malignant disease are frequent, in spite of the trained staffs and complete diagnostic facilities which such institutions afford. How much more fallacious must be the causes of

death registered by general practitioners? These fallacies largely nullify many statistical inquiries, for example, the relative incidence of different types of cancer, and other chronic diseases, such as endocrine disorders, nephritis, anemias and cirrhosis, in relation to social class, occupation, nationality, and other factors. The obscure causes of many of these diseases will remain obscure until we adopt a scientific attitude towards precision of diagnosis and registration.

To all interested in public health problems, I commend W. C. Hueper's admirable work on "Occupational Tumors and Allied Diseases" (1942), from which, in conclusion, I quote the following: "Only the establishment of accurate, complete, and reliable morbidity statistics on cancer . . . can provide in any effective degree those data pertinent to the determination of the character and action mechanism of the environmental agents which cause cancer."

Yours, etc.,

RUPERT A. WILLIS,  
M.D., D.Sc. (Melbourne),  
F.R.C.P. (London).  
(Pathologist.)

The Alfred Hospital,  
Melbourne,  
March 10, 1943.

SIR: The air is full of what the Government is going to do with the doctors in the matter of a national health service and the public are taking very little interest in the matter. What is the use of the profession trying to fight the Government on its scheme? Let the public do the fighting for us. Let us foist the scheme on the public and let the public then approach the Government in the matter of a national medical service which will combine the best of the present system with the best in the Government's proposal.

My suggestion is that say three suburbs, an industrial, a semi-industrial, and a residential, be selected by the local British Medical Association and the Government scheme applied *in toto*—the rest of the profession being bound not to attend any of the people from these districts. If the doctors are loyal to their colleagues (and I am afraid there is the catch) I can imagine the howl which will ascend to high heaven from the "beneficiaries" of the Government scheme.

Yours, etc.,

J. LEON JONA.

61, Collins Street,  
Melbourne, March 11, 1943.

SIR: Dr. Groves's timely article *re* the value of post-mortem examinations for the advance of medical science has my highest commendation.

After three years' service at this home, I have had many problems presented, in which only a skilled pathologist could make an accurate and definite diagnosis. That so much material as presents itself in this home for advancement of clinical knowledge should be going waste has caused me many regrets, but I am hopeful that in any change that is, and should be, considered by the powers that be, this most important section of medicine will not be neglected.

Yours, etc.,

CHAS. PERRY, M.B., B.S. (Melb.).

Cheltenham, S.22,  
Victoria,  
March 9, 1943.

### THE ARMY AND TUBERCULOSIS.

SIR: In the journal of February 6 appears a report of the evidence given by Dr. John Hughes, Director of the Tuberculosis Division of the Department of Public Health, New South Wales, before the Parliamentary Joint Committee on Social Security. Several of the statements attributed to him are not in accordance with fact, and if allowed to stand uncontradicted may cause uneasiness both to the profession and to the public.

Dr. Hughes is quoted as saying that "the Army issued a statement that no man was to be labelled tuberculous unless a full investigation was made and unless he produced two specimens of sputum containing tubercle bacilli or the guinea-pig test produced a positive result". This is only part of an instruction which goes on: "or if the diagnosis is concurred in by a medical representative of the Repatriation Commission".

It is obvious, and indeed is clearly stated in the instruction, that the object of this instruction is to aid the Commission by preventing premature and inaccurate diagnosis of tuberculosis in a doubtful case. Any man who is thought to be suffering from tuberculosis is brought, after full investigation, before a medical board on which is such a representative of the Commission, and if the diagnosis is agreed on it is recorded and he receives a pension for pulmonary tuberculosis.

The Repatriation Commission has never insisted on the demonstration of tubercle bacilli as necessary to the acceptance of the diagnosis and has accepted many men in whose sputum bacilli have not been found.

Men discharged as medically unfit are directed to the Repatriation Officer and not to their own doctor. Dr. Hughes's remarks appear to refer to men in whom findings suggestive of tuberculosis are found when they were examined as recruits. It is obvious that such men are not entitled to pension benefits and they have always been advised to go to the Tuberculosis Department for investigation unless they have a private doctor to whose care they prefer to entrust their health.

Men whose condition is considered to have been caused or aggravated by military service are referred to the Repatriation Commission, and if the claim is upheld the responsibility for further investigation and treatment is accepted by the Commission.

It would be a pity if so false a picture as that painted by your report of Dr. Hughes's evidence were allowed to pass uncontradicted.

Yours, etc.,

S. ROY BURSTON,  
Major-General, Director-General  
of Medical Services.

Allied Land Forces Headquarters,  
Victoria Barracks,  
Melbourne.

February 24, 1943.

#### LYMPHOGRANULOMA INGUINALE: AUSTRALIAN RECORDS.

SIR: Inadvertently omitted in my letter in your issue of February 27, 1943, page 197, was the following:

H. K. Porter and A. J. Cunningham: "Lymphopathia Venereum or Esthiomene, with Report of a Case", THE MEDICAL JOURNAL OF AUSTRALIA, October 14, 1939, page 571. The patient was a woman of 59 with esthiomene. She had been in Suva for nine months in 1927. Symptoms had begun in 1930. She was finally seen in July, 1939. The Frei test was positive.

Yours, etc.,

The University of Adelaide,  
Adelaide,  
March 12, 1943.

J. B. CLELAND.

#### DEATHS FROM DIPHTHERIA.

SIR: It is a terribly tragic experience to lose two diphtheria patients within a few days, as we did recently. The tragedy is emphasized as, in the first place, diphtheria is an entirely preventable disease and, in the second, in both cases treatment was held up by waiting for a swab result.

The first child, an inmate of a public institution, had been ill for four days before admission with severe diphtheria of the bull neck variety. A swab had been taken on the third day and the result awaited before sending him to hospital. He did not respond to treatment as too much irreversible damage had been done by the toxin.

The second child was ill only two days. His doctor, examining him on the first day, prescribed a small dose of antitoxin and took a swab. By the time the result of this was available the child was in *extremis* with laryngeal obstruction. The parents had not called the doctor during the night as they interpreted very literally Press injunctions not to disturb doctors except in emergencies. The child died before reaching hospital.

Both these cases illustrate the often warned against danger of "waiting for the swab". They underline the teaching that the diagnosis of diphtheria is the job of the clinician, not the bacteriologist. The swab is a useful adjunct, but

only an adjunct, in the diagnosis of doubtful cases. Where a sore throat is suspicious enough to warrant swabbing for *Corynebacterium diphtheriae*, treatment for diphtheria with adequate doses of antitoxin should be commenced at once. The only exceptions are mild cases which are under continuous observation.

In at least a third of the fatal cases of diphtheria treated at this hospital, waiting for swab results is a major factor in the fatal issue.

While there is need for improvement in the clinical diagnosis of diphtheria and in the treatment of severe cases, the major need is for much more active campaigning for diphtheria immunization for the pre-school and young school children, and for the provision of convenient immunizing clinics open at frequent regular times to replace the present spasmodic "campaigns".

Yours, etc.,

ALAN FINGER,  
Medical Superintendent.

Metropolitan Infectious Diseases Hospital Board,  
Northfield,  
South Australia.  
March 17, 1943.

#### BREAST FEEDING.

SIR: There is only one reason, except pregnancy, for the weaning of an infant in the early months, and that is consideration for the mother's health. This is a good reason, but may be made a very bad excuse. Babies are also weaned because the mother has to go out to work, or is overburdened by work in her home. These are not medical reasons, but the result of defects in our social economy.

In the bad old days, when infant mortality in the first year rose to 120 per 1,000, it was not uncommon for babies to be weaned early on medical advice, given either from grave want of knowledge or gross deficiency in a sense of responsibility. All this, I hope, is now a thing of the past. But cases of unnecessary weaning are still met with. They are no proof of want of maternal love, but result from many causes—ignorance, carelessness, the advertisements of infant foods, bad advice from grandmothers and other relatives, neighbours, and sometimes (I am sorry to say) even from registered nurses.

To combat this menace we need to use all our authority and influence at every opportunity, for the ultimate responsibility for infant health rests with the medical practitioner.

Yours, etc.,

Brisbane,  
March 16, 1943.

A. JEFFERIS TURNER.

#### THE SELECTION OF MEDICAL STUDENTS.

SIR: The selection of medical students is causing grave concern not only to the profession but to the general public, as evidenced by expressions and opinions in the lay Press and in THE MEDICAL JOURNAL OF AUSTRALIA. My own experience confirms the opinions given by Dr. Swanton in the letter published in the journal on February 20, 1943, relative to factors which should influence selection. As a case in point I would mention that the university has not found it possible to accept a daughter of mine as a student in a reserved faculty.

For the last two years at school I had this daughter taught science subjects as an introduction to medicine, namely, chemistry, physiology, botany and zoology, but she sat for the last two only at the Leaving Examination and secured A passes. The other subjects compulsory for matriculation she passed as B grade. I was quite happy at this result, and especially so since a psychology test showed a "high average" general intelligence, "superior" practical capacity and "very superior" manual dexterity; so she started coaching in chemistry and physics. No inquiry was made at her school, nor was I asked for any details, and on lodging her application was told merely to fill in a form which asked only for her Leaving Examination results.

I have been student, lecturer, demonstrator, and examiner in either anatomy or surgery or both for forty-two years, and during that time have learned to assess the mental calibre and general fitness of the average medical student, and I agree with Dr. Swanton's remarks on the subject

of "failures" which in most cases result from improper selection.

Some five or six years ago an interesting article was published in the journal on the results during their course, of medical students, in which it was shown how necessary was a school foundation in science for a successful career as a student in medicine, and I sent copies of this article to several headmasters at some of our main schools and acted on it for my own children.

At a recent examination in anatomy I was amazed at the poor standard of education and the low mental attainments of many of the students, and it made me wonder why many of them were ever allowed to commence the course.

Dr. Kent Hughes, in her letter published on March 20, 1943, refers to continental evacuees in a recent list of exhibitions and doubtless one will find a very high percentage of them entering medicine to the exclusion of our native born Australians.

Professor R. C. Mills, Chairman of the Universities Commission in the Department of War Organization of Industry, writes me as follows: "The position is that although the Commission has been concerned in collaboration with manpower in the fixing of quotas for 'reserved' faculties, it has left to the universities the responsibility of choosing the necessary number of students to fill them. The universities were instructed to use the method of selection which they used last year. The Commission will deal with students only after they have been selected by a university."

Those of us who had been dissatisfied with the method of selection last year expected the Commission to evolve some more suitable and equitable method this year, but apparently the task has been beyond their powers and the mistake of last year has been repeated. It was not until Mr. Dedman's announcement in the Press on the nineteenth instant and Professor Mills's letter received on the same day that I realized the state of affairs, for on lodging the application at the university I was told the selection would be made by the Commission.

It is to be hoped that provision will be made in the application forms next year for some statement as to factors which may or should influence selection other than the mere lucky or often unlucky examination pass, and that such factors will be given due consideration.

Yours, etc.,

225, Macquarie Street,  
Sydney,  
March 20, 1943.

HUGH R. G. POATE.

### Notice.

THE New South Wales Post-Graduate Committee in Medicine announces that the programme of lectures being held at 4.30 p.m. each Monday afternoon at the Royal Australasian College of Physicians, 145, Macquarie Street, Sydney, has been altered as follows: Monday, April 5, "Malaria", Colonel N. Hamilton Fairley, C.B.E.; Monday, April 12, "Maxillo-Facial Injuries", Lieutenant-Colonel K. W. Starr, O.B.E., Major G. Arnott; Monday, April 19, "Intravenous Therapy in Hemorrhage, Burns and Shock", Major R. J. Walsh.

### Medical Appointments.

Dr. Albert Ernest Coates, pursuant to the provisions of the Medical Act, 1928, of Victoria, has been appointed a member of the Dental Board of Victoria.

Dr. Wilfred Arthur Joseph Brady, pursuant to the provisions of the Lunacy Acts of Victoria, has been appointed Superintendent (acting) of the Mental Hospital, Kew, Victoria.

### Books Received.

"Forensic Medicine, A Text-Book for Students and Practitioners", by Sydney Smith, M.D., F.R.C.P. (Edinburgh), D.P.H., with an introduction by Professor Harvey Littlejohn, F.R.C.S. (Edinburgh), F.R.S.E.; Eighth Edition; 1943. London: J. and A. Churchill, Limited. 8½" x 5½", pp. 672, with 179 illustrations. Price: 28s.

"A Short Textbook of Midwifery", by G. F. Gibberd, M.B., M.S., F.R.C.S. (England), F.R.C.O.G.; Third Edition; 1943. London: J. and A. Churchill, Limited. 8½" x 5½", pp. 562, with 195 illustrations. Price: 21s.

"Catechism Series: Anatomy (The Thorax and Lymphatic System)", Part V, by Charles R. Whittaker, F.R.C.S.E., F.R.S.E.; Fifth Edition, revised and enlarged. Edinburgh: E. and S. Livingstone. 7½" x 4¾", pp. 80. Price: 1s. 6d., postage 2d.

### Diary for the Month.

- APR. 6.—New South Wales Branch, B.M.A.: Organization and Science Committee.
- APR. 6.—Tasmanian Branch, B.M.A.: Branch.
- APR. 7.—Victorian Branch, B.M.A.: Branch.
- APR. 7.—Western Australian Branch, B.M.A.: Council.
- APR. 9.—Queensland Branch, B.M.A.: Council.
- APR. 13.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
- APR. 20.—New South Wales Branch, B.M.A.: Ethics Committee.
- APR. 21.—Western Australian Branch, B.M.A.: Branch.
- APR. 22.—New South Wales Branch, B.M.A.: Clinical Meeting.
- APR. 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- APR. 28.—Victorian Branch, B.M.A.: Council.
- APR. 29.—New South Wales Branch, B.M.A.: Branch.
- APR. 29.—South Australian Branch, B.M.A.: Branch.
- APR. 30.—Queensland Branch, B.M.A.: Council.

### Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

**New South Wales Branch** (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmalm United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

**Victorian Branch** (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

**Queensland Branch** (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

**South Australian Branch** (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

**Western Australian Branch** (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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